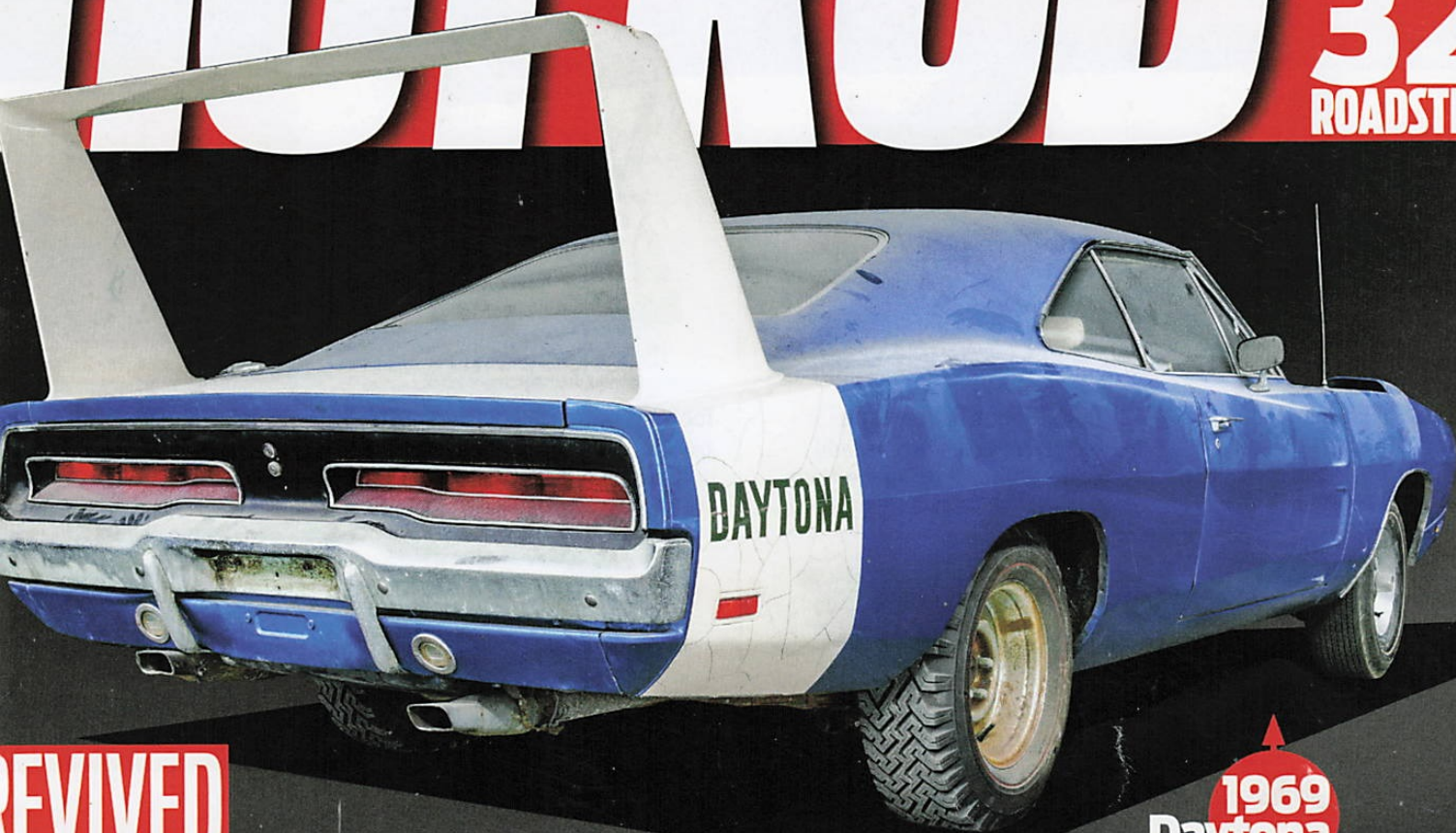




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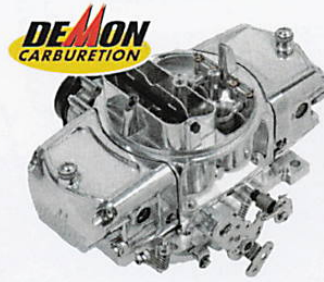
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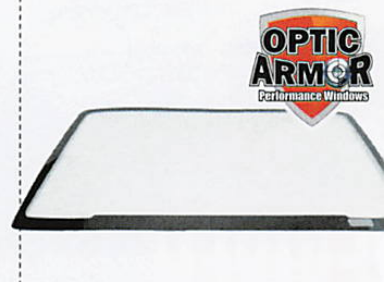
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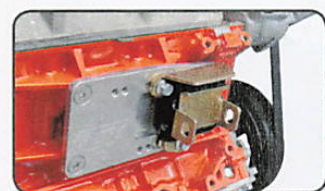
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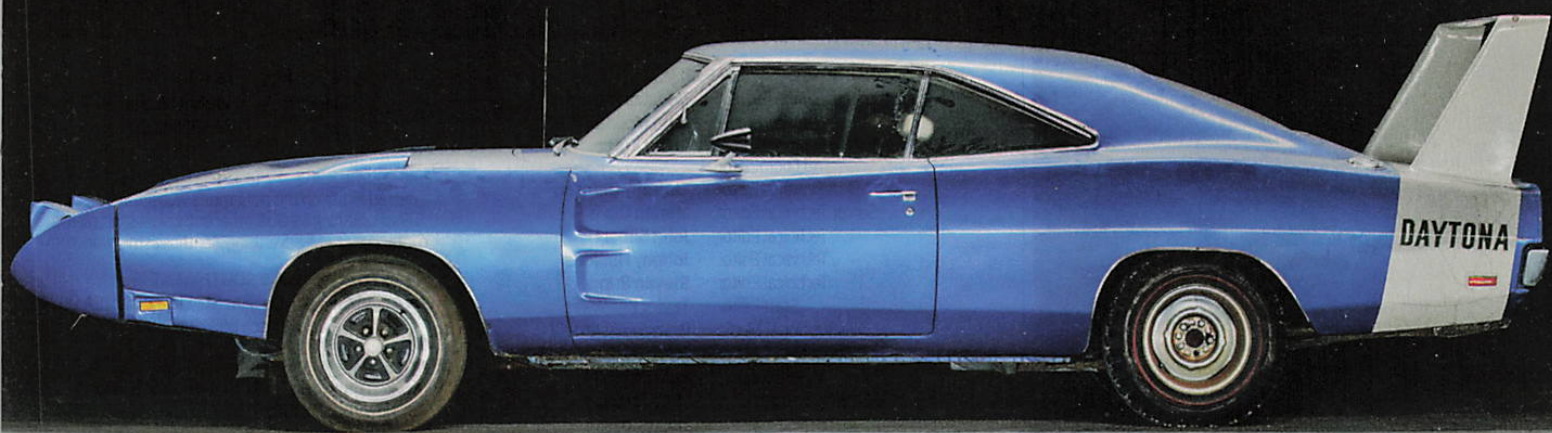
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30

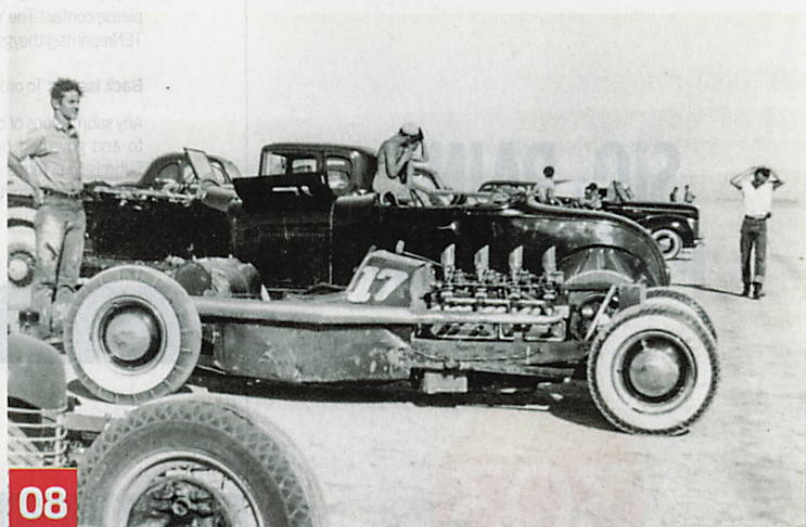


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0720 HOT ROD

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By John McGann

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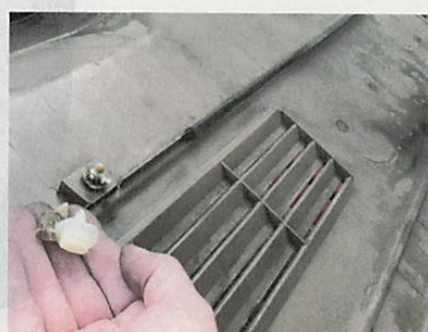
This is a tough one to write. More than a month into quarantine from this virus that threatens to crash the world's economy, what could I possibly say to help, inspire, or support anyone who is struggling?

I think what we can do is take inspiration from the adaptability and tenacity of the people around us and the businesses that are finding creative ways to respond to and survive the crisis. In the midst of dire news of layoffs, furloughs, and stay-at-home orders, we find a way to persevere. Uber and Lyft drivers are now bringing us groceries and take-out food instead of shuttling us to the airport. Car shows have gone online, and that's a surprisingly cathartic and pleasant way to spend time on social media. Radwood held a virtual car show on Instagram recently, and the hashtag #VRadwood has more than 1,000 posts as I write this, just two days later. @RadwoodOfficial monitored all the posts, compiled their favorites, and solicited votes for the best cars in each of several categories. Gift cards were awarded to the winners of each.

Big, nationwide companies like Holley have dropped shipping fees to help pass a price break on to customers stuck at home, and this is a great time to tackle that project you've been putting off, or cleaning and organizing your garage. David Freiburger texted me last week to say that after several days' work, this is the first time in more than a decade he has been able to walk into his garage. Sometimes, it's these little things we have to hold on to when things are bleak. Local breweries and restaurants have quickly shifted to take-out or delivery. One of my favorites is Common Space Brewery in Hawthorne, California, who, early into the quarantine, announced their "put the cans in your hands" pick-up

or delivery policy. While I miss drinking their Random and Dangerous IPA on their patio, it tastes just as good here in the warehouse, where I'm spending all my time.

Personally, I've been working on Truck Norris and Project Jake, building a steering linkage and making custom brake lines for the former, while fixing squeaky door panels and performing maintenance to the latter. I've thoroughly enjoyed watching historic Trans Am racing on YouTube and recently found a treasure trove of Trans Am races from the late '80s, cars that I personally saw at Burke Lakefront Airport where I grew up in Cleveland, and at Mid-Ohio, one of the best race tracks in the country. My barbeque grill is getting a workout



each night, and I've been using a fender stand to dry my laundry out in the sun. ProTip: I've learned to clamp my clothes to the stand after chasing a stray sock carried down the driveway in a gust of wind.

Trying to do our part, we're uploading more content than ever to HotRod.com, with some really great engine tech, how-tos, weekend quarantine projects, and virtual garage walk-throughs. Our cars and shop dogs feature have been especially popular. Stop back often to see what we are all up to, submit a picture of your shop dog (or shop cat), your car, or what you're working on in your garage. We Americans are resilient and industrious people. We will weather the storm. Stay safe, everyone!



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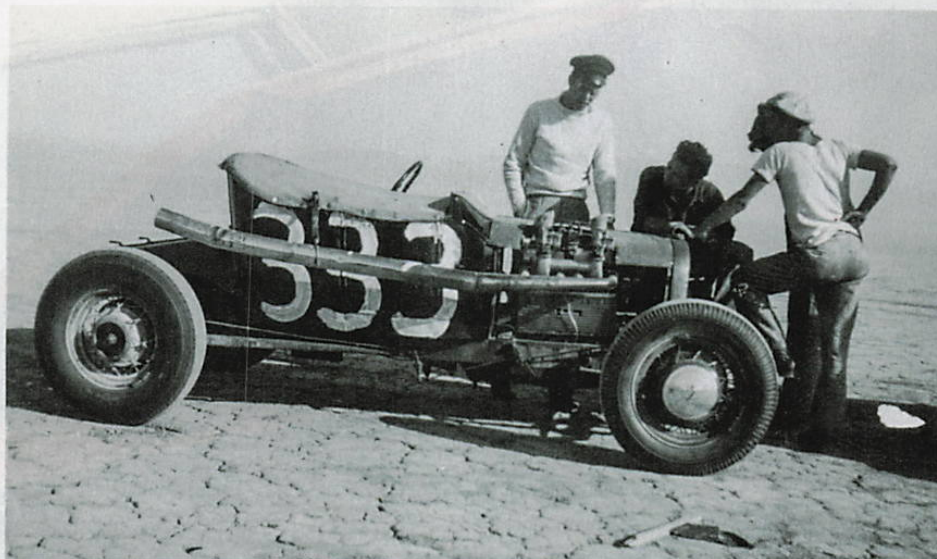
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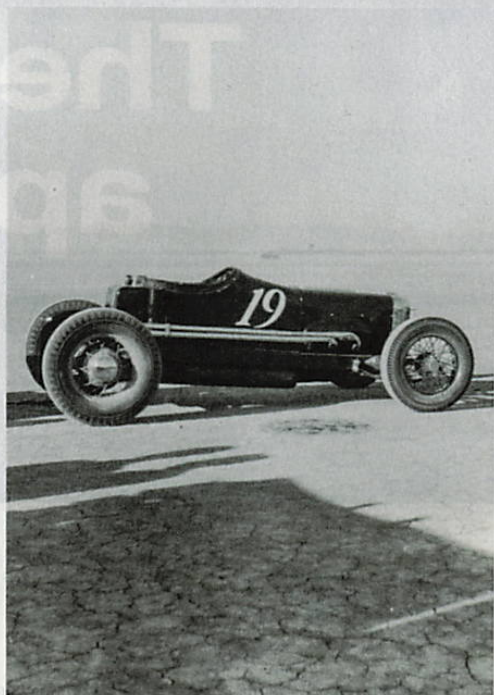
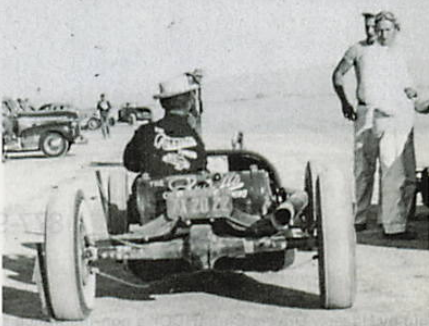
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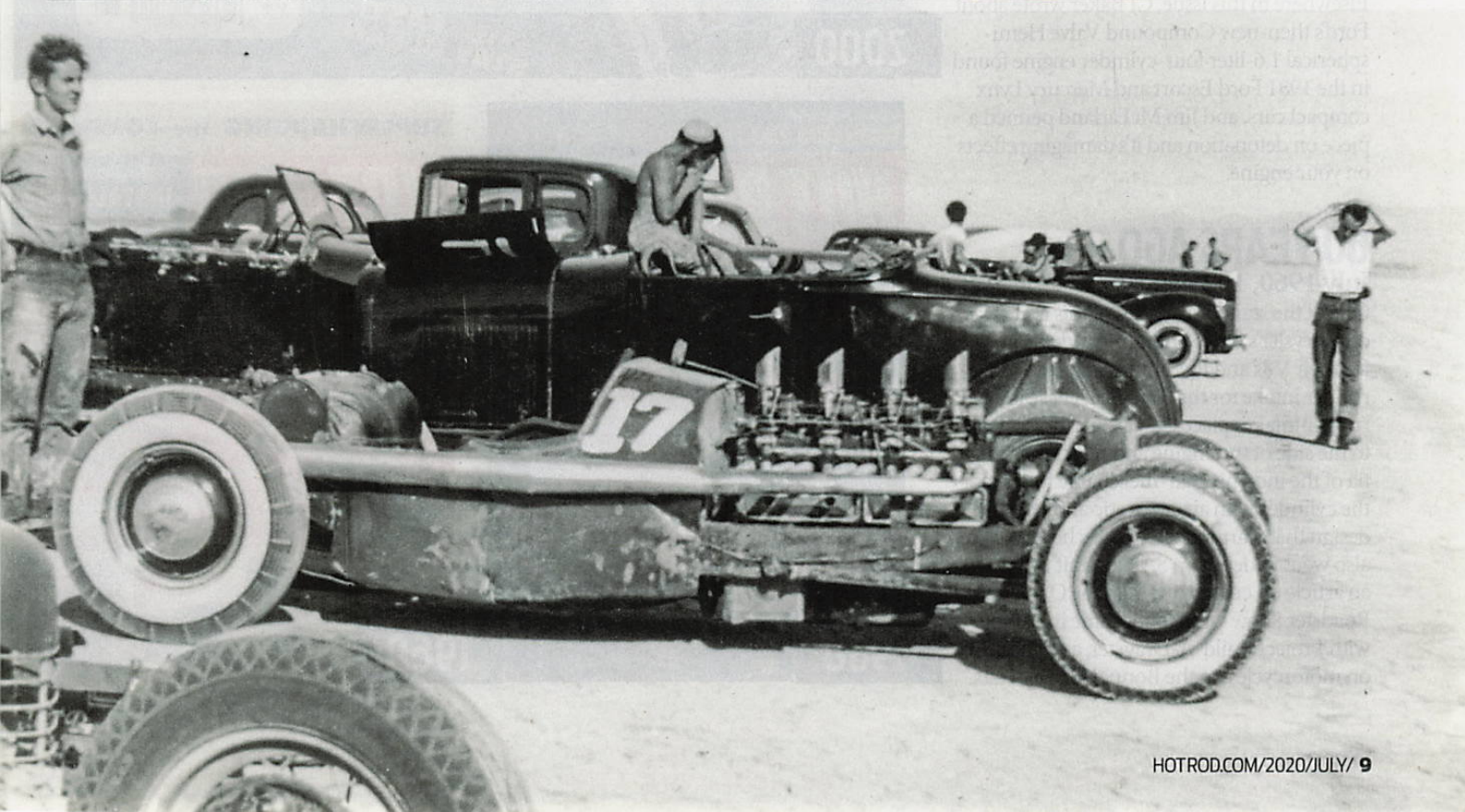
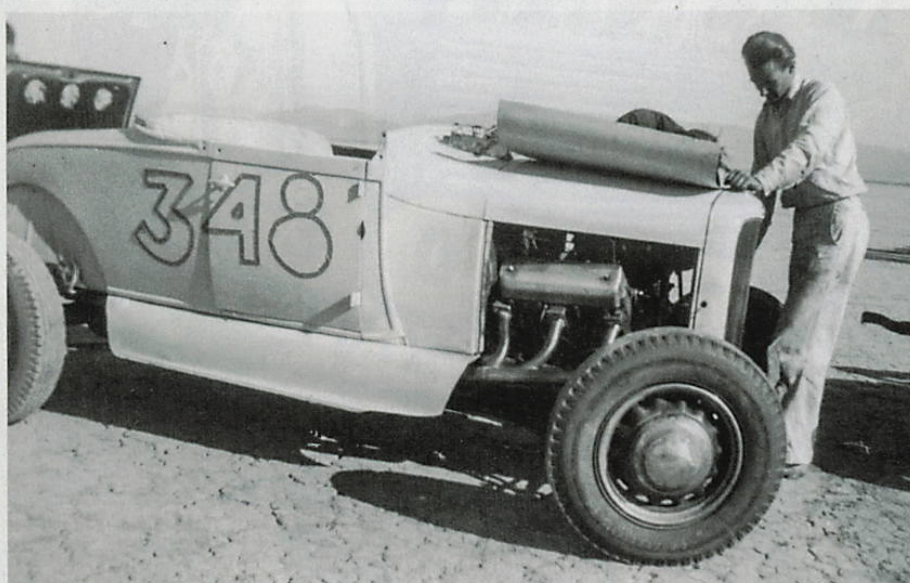
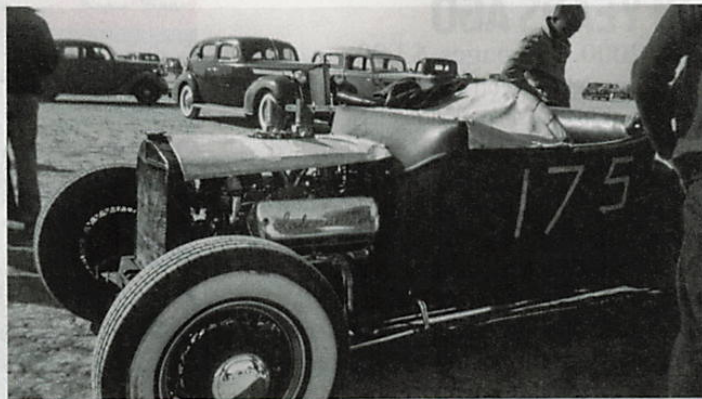
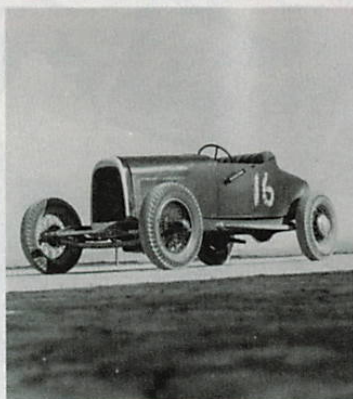
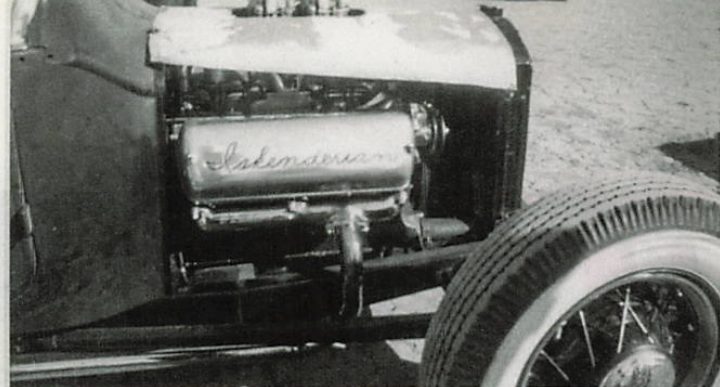
In the early days of California's hot rod culture, serious racing was done at a small group of dry lake beds in the Mojave Desert named Rosamond, Harper, El Mirage, and Rogers. Situated at the edge of Rogers Dry Lake was Muroc, a desolate farming settlement on a little-used Santa Fe Railroad line with a depot, a small store, and not much else.

The Western Timing Association and its friendly rival, the Southern California Timing Association (SCTA), liked Muroc for timing meets because of its proximity to Highway 99 and the fact that Rogers was, by far, the largest dry lake in the region. Unfortunately, the Army Air Corps liked Rogers Dry Lake, too—for use as a bombing range. Racing activity was curtailed at the lakes with the start of WWII, then after the war, the Air Force claimed Rogers as its own. Hot-rodders weren't allowed back. Rogers Dry Lake became Edwards Air Force Base, and the rest is history. Today, the roar of a Model B four-banger or a flathead V8 is part of a distant past, and the area is a vast military reservation.

The images in this pictorial were taken by the late Ellis Taylor, who in 1940 was a teenage hot-rodder who lived in Santa Monica. He and some friends made the trek out to Muroc for the July SCTA meet and took these remarkable photos. They were generously supplied by central coast racing legend Lee Hammock.

Tony Baker





The HOT ROD Archives

20 YEARS AGO

July 2000, 156 pages, \$3.99

This issue delivered on a number of levels. Want a deep dive on emissions-legal engine swaps? Tech Editor Terry McGean handled that deftly with the cover article. How about a bucks-down, big cubic-inch engine build? Steve Magnante brings the noise with a 500 cubic-inch Cadillac, an engine family he became synonymous with. In that installment of the "Junkyard Jewel" engine series, Magneto's Caddy went from 303 hp and 468 lb-ft of torque to an impressive 450 hp and 580 lb-ft, all with bolt-on parts. Other highlights include a performance Quadrajet rebuild, and an in-depth look at combustion chamber design and the effect on combustion efficiency.

40 YEARS AGO

July 1980, 116 pages, \$1.50

Sweet graphics and panel paint jobs ruled the Street Machine scene of the early '80s, so we're guessing this issue was a big hit on newsstands and in the mailboxes of subscribers at the time. In a mix of color and black-and-white images, seven pages of this issue were devoted to custom paint how-to articles. Paint and body-themed issues continue to sell well even today. It's one of those mystery jobs people love to read about. Elsewhere in this issue, CJ Baker wrote about Ford's then-new Compound Valve Hemispherical 1.6-liter four-cylinder engine found in the 1981 Ford Escort and Mercury Lynx compact cars, and Jim McFarland penned a piece on detonation and its damaging effects on your engine.

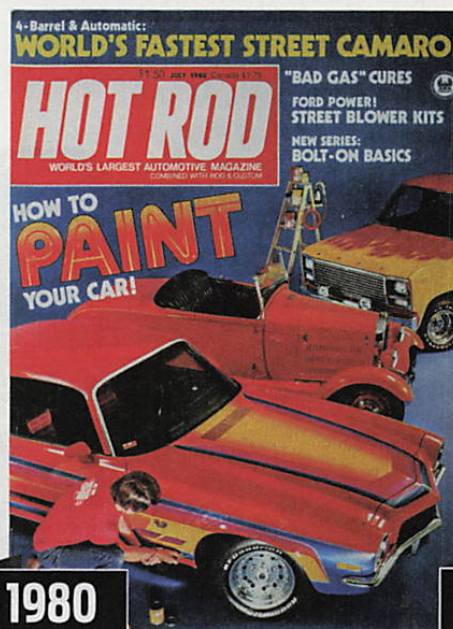
60 YEARS AGO

July 1960, 132 pages, 35¢

One of the standout articles of this issue was on Chrysler's new Sonoramic Induction for their V8s and the similarly shaped long-runner intake for the Slant Six. These long-runner intakes place the carburetors way off to the side of the engine and rely on the inertia of the incoming air-fuel charge to pack the cylinder with air, an exotic and effective design that warranted 5.5 pages here. We also went in depth on SAE aircraft fittings in an article on custom tubing. The Oakland Roadster Show winner got some ink along with Project Build-A-Dragster, and a feature on motorcycles on the Bonneville Salt Flats.



2000



1980



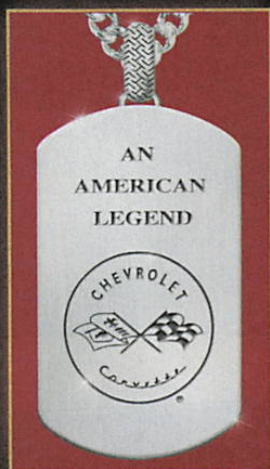
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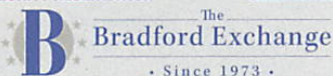
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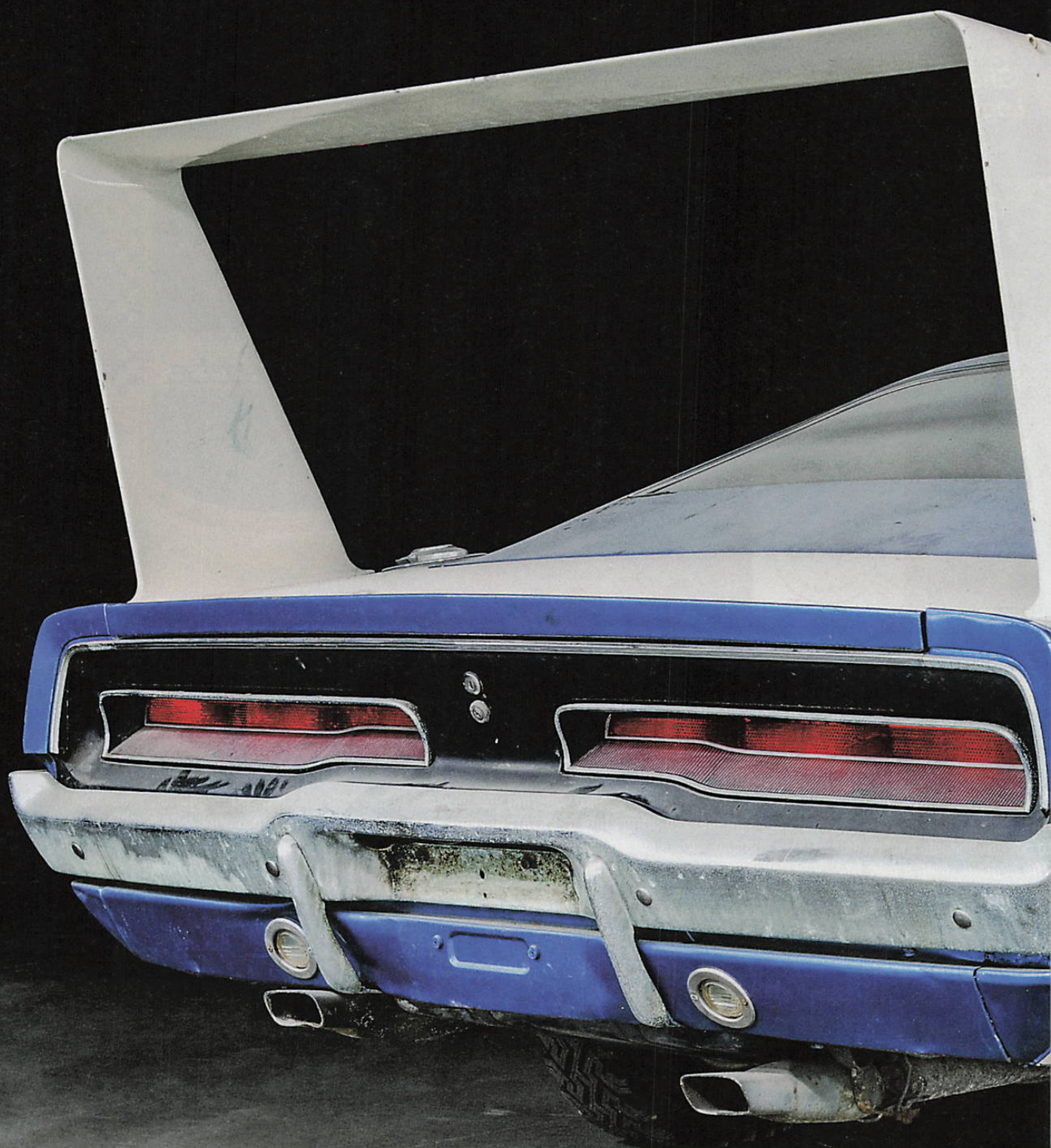
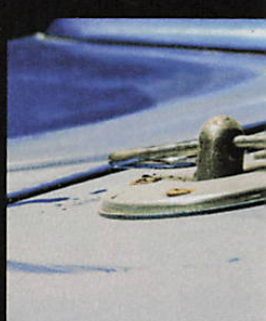
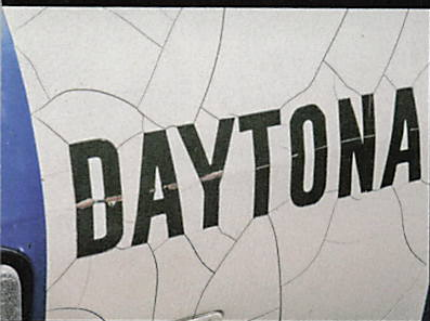
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Hidden since 1974, Ronnie Belletieri's 1969 Dodge Daytona is set to undergo a full OE restoration.

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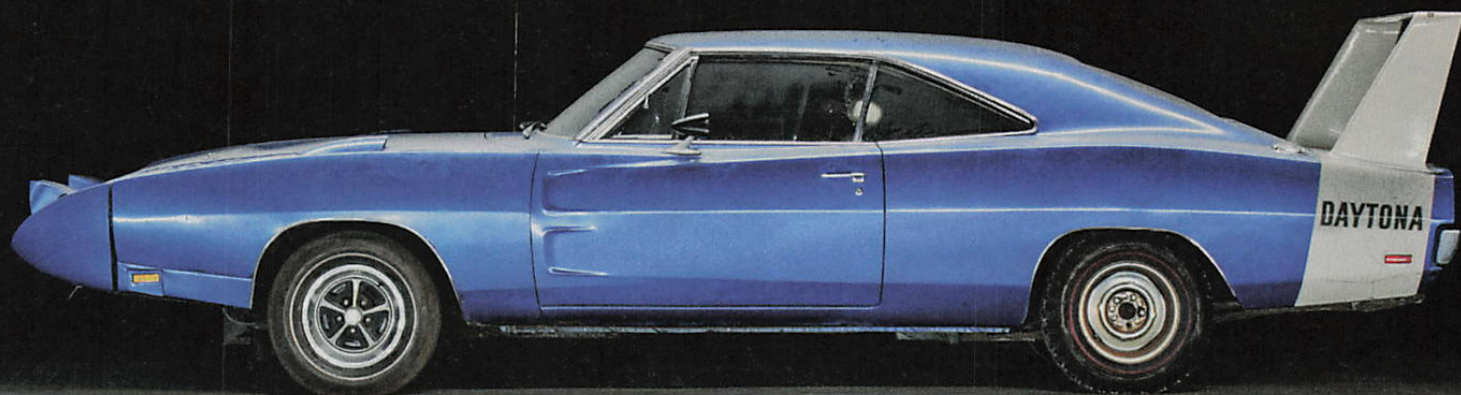
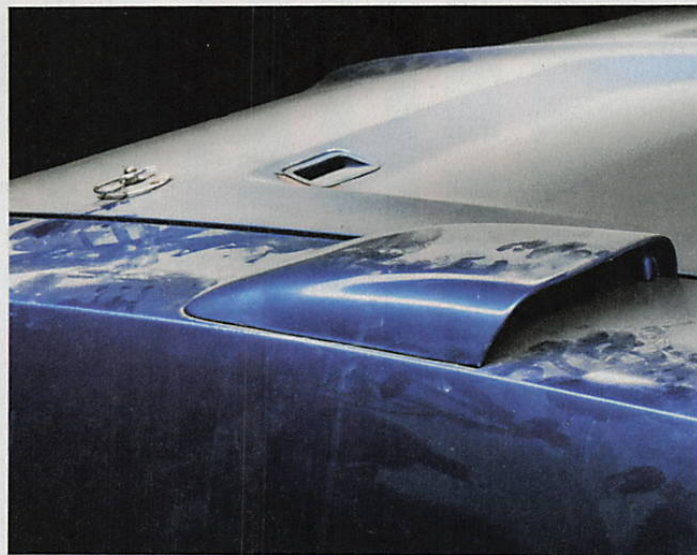
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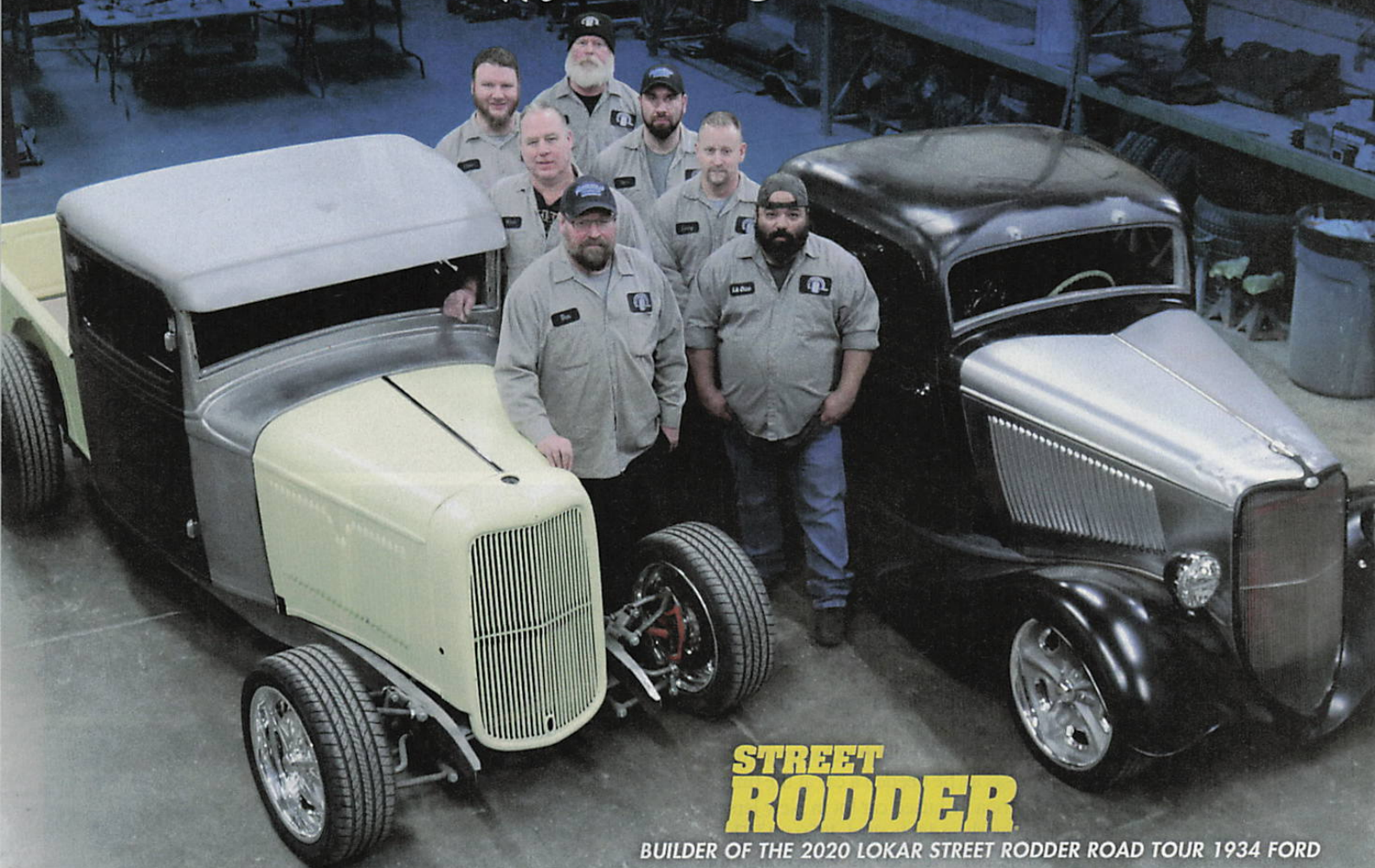
People really dig reading about and looking at old cars pulled from barns. Even if you're not a hardcore gearhead, the idea of finding something stashed away that is worth a few bucks has a universal appeal. If you're dialed in to the whole car thing you appreciate them even more, but the expectation is that at some point the well will eventually run dry on these finds. We're not quite there yet, and like clockwork, they keep surfacing at a steady rate. Even if they've never seen the inside of a barn, they are by default lumped into the barn find category. We'll just cut to the chase at this point and tell you that the 1969 Dodge Daytona that you're looking at is a barn find that has never seen the inside of a barn—and that's a really good thing.

The accepted production run for 1969 Dodge Daytona's is 503 domestically, so on a desirability scale they're right up there. The sole reason for their existence was a result of the NASCAR homologation process in 1969. If they wanted to race them, Chrysler had to produce 500 road-going examples. In civilian trim there were only two flavors available under the hood. The standard engine was the 440 Magnum rated at 375 horses, and the extra cost 426 Hemi rated at 425 horses. Either of those mills could be ordered with a 727 Torqueflite automatic or an A-833 four-speed. Because these were extremely low production vehicles with a single purpose, Chrysler contracted Michigan-based Creative Industries to do the final assembly. Brand new 1969 Dodge Charger R/T's were loaded up and sent to their facility, and once there had the nose, rear wing, and rear window plug installed, and a quick splash of paint applied to blend it all into the existing color. That's where this Dodge Daytona was born. It was wearing Dark Green Poly paint, a white bucket seat interior, and a rear white-stripe, and that's how it was shipped to its final destination sometime in 1969.



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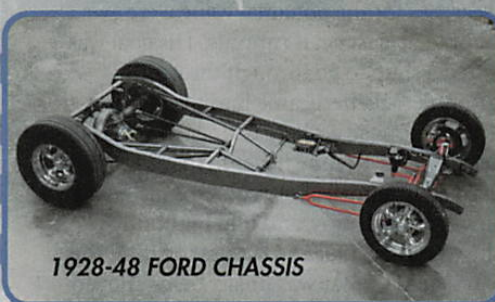


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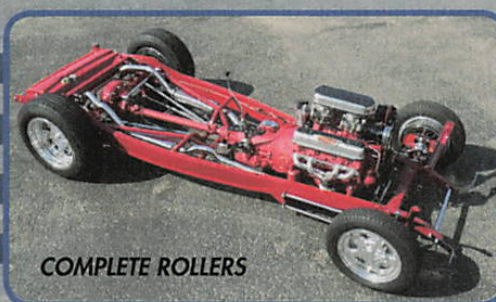
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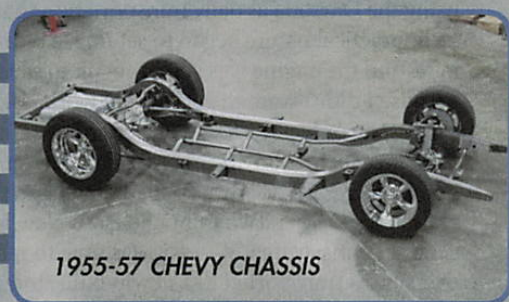
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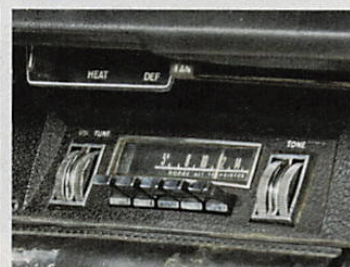
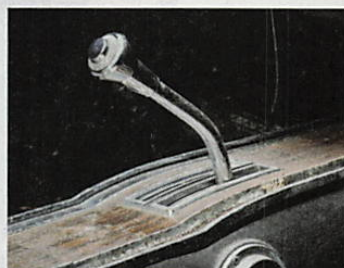
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HIDDEN & FORGOTTEN

Its story starts at Creative Industries; however, we don't know anything about it from the point it was sold new up to 1974. That span of just over four years is a complete mystery, but the person we believe to be the second owner sat down with us to share his story. We were fortunate to speak to him, but before we go much further, we want to point out that he has asked not to be named in the story, so we are going to honor that request and call him Owner Two. His story starts out as one of need—as in, he needed a car at the time as a daily driver. “I found the Daytona in a used car lot in New Jersey,” he explains. “I needed a car for work and it looked different.” The interesting shape of the car caught his eye and that was enough for him to dig into his savings and buy it. At the time it had just over 37k on the odometer—and it was green. He really hated that green, so before it ever logged any miles in his hands, it was treated to a quick and dirty respray of metallic blue, inspired by a B5 Blue 1970 Dodge Charger that his brother owned. It wasn't until he actually started using the Daytona as daily transportation that the sobering reality of its impractical nature began to set in. He recalls, “The car was very loud, and the engine was very difficult to start. That was a problem because I didn't want to get stuck at work.” Because of the loud exhaust he only put a few hundred miles on it and then parked it in the garage before buying another daily driver to replace it. At that point, the garage door was pulled down and that was it.

In 2003, Owner Two migrated from New Jersey to a town in central Pennsylvania. When it was time to move the car one state over, it was transported to a newly-built storage facility. In a carbon copy of years past, the garage door rolled down and it was once again



forgotten. It wasn't until 2019 that Owner Two decided it would be prudent to sell it. Google searches for the potential value were eye opening, and a real motivator to at least get it running. His goal was to sell it at auction, so he hired a shop to go through the car.

It was at that point that Ronnie Belletieri came into the picture. Ronnie's friend owned the storage facility where Owner Two was the first customer back in 2003, however Ronnie never managed to find out what kind of car was parked in storage. For years Ronnie heard about the mystery car that was tucked away, and told his buddy that if it was the right car he would be interested in buying it. At the beginning of 2019 Ronnie was told the car was finally being moved and that it was a Charger Daytona. At that point Ronnie asked his



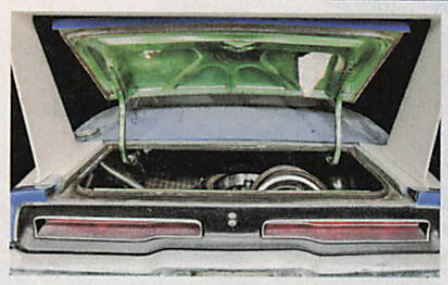
WARNING: Smokeless tobacco is addictive.

HIDDEN & FORGOTTEN

friend to contact Owner Two about buying it. Numbers were tossed around and they agreed on an amount that satisfied both individuals. Ronnie's biggest concern was what if the shop that had taken the car did something stupid with it. He recalls, "I told Owner Two that you have to call that guy up, whoever has your car, and you have to tell him he cannot start it up, or get it running. If it's all original I want it as is." The fear that the shop was going to disrupt the originality of the car never took place, and the car was taken back to the storage facility.

While all this was taking place, Ronnie started looking for someone to better inform him on the value of the Daytona and how much it would cost to restore. He was a faithful viewer of *Graveyard Carz*, and often heard Instrument Specialties being mentioned on the show. But, it wasn't until he started doing some Google searches that he found Mike Mancini and his other business, Mike Mancini's American Muscle Car Restorations. The deal to restore the car was sealed when Ronnie saw the red Daytona restored by Mike's crew on the cover the June '18 issue of *HOT ROD*.

Ronnie was already the owner of the Daytona when he met Mike for the first time at the 2019 Chrysler Carlisle Nationals show to discuss the restoration and its transportation back to Rhode Island. After the Daytona was parked at Mike's shop, an assessment was made, and he notes, "It's a legit car. It is amazingly clean. It doesn't seem like there is any rust on it anywhere. We put it on the lift and it is bone dry. It's as clean as it could be. It's unmolested, except for that dismal repaint." The first unveiling of the car in its unrestored state was at the 2019 Muscle Car and Corvette Nationals, and we're pretty sure that, based on previous editions of the show, Mike will be unveiling it there once it's finished. 



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COOKIE'S

32

 Drew Hardin  Wes Allison





■ The roadster's "six-wheel" configuration makes it a standout wherever it goes. "Pop liked stuff that was different," Jeff says. The roadster retains many of its original components, like the working cowl vent. Even the wood around the back of the cab is original, and it's in remarkable condition for being nearly 90 years old.

COOKIE'S '32

W

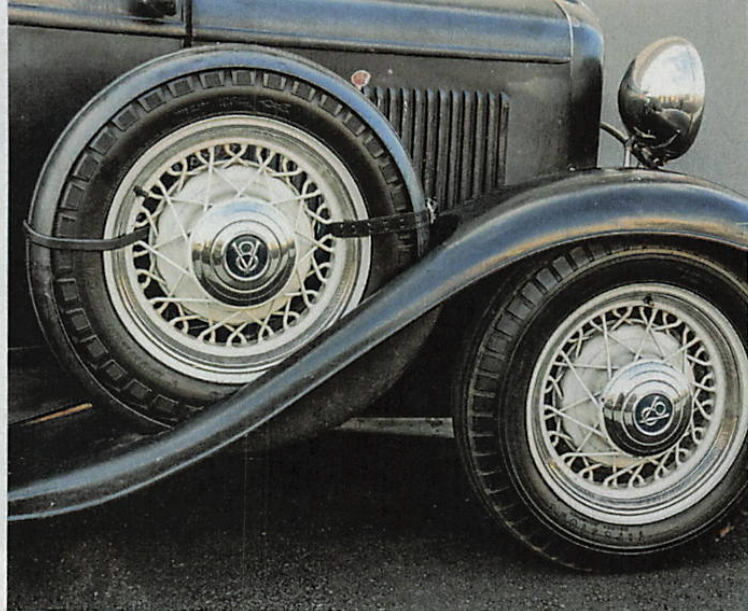
hen he was a kid, William Lind would often sneak out of his house to a bakery across the alley and ask if he could have a cookie. The little guy did it so often the bakers nicknamed him Little Cookie.

The name stuck. People knew him as Cookie, and when he raced at the Antique Nationals in the 1970s, his flathead-powered '27 T, which had been built by Bean Bandit Joaquin Arnett, was named Cookie Monster.

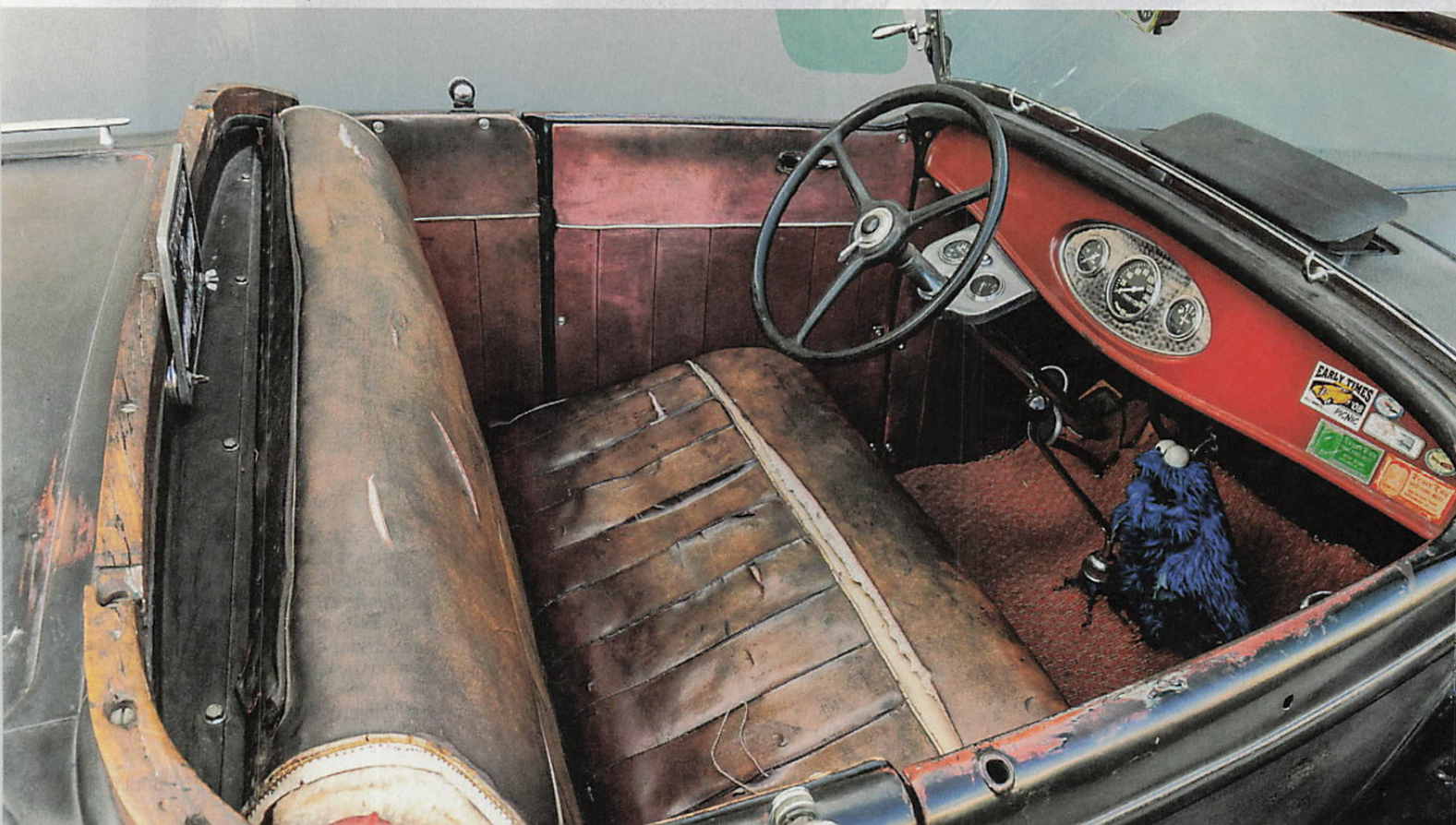
That's also why a furry, blue, goggle-eyed *Sesame Street* character lives on the floorboard of this '32 roadster.

Deuce roadsters are precious things these days, and this one is too, but not just for rarity or collectability sake. This roadster has been in the Lind family since Cookie bought it in the late 1950s. His son Jeff is now the car's caretaker, preserving it as his dad would have wanted.

"When he finished all the bodywork, he painted it in black primer," Jeff tells us, pointing at the early-'60s-vintage paint still on the car today. "He said, 'If I painted it, it would be too final. Then what would I do with it?'"



■ **Top:** Dual sidemount fenders were an incredibly rare option on '32 roadsters. Cookie found these years ago in a giant collection of Ford parts. The locks on the wheels were there to thwart tire thieves during the dark days of the Depression. **Lower left:** Note that Cookie left trim intact on the '32 grille shell. "The radiator cap isn't on backward," Jeff says, "it's more aerodynamic that way." **Bottom:** Jeff says he's "not sure" when his dad put the interior in the car. "It was probably a swap meet find," he says of the upholstery, which he describes as "some sort of pre-vinyl vinyl." Deuce Day dash plaques from the '70s are joined by show plaques from after the car's 2007 freshening. And Cookie's namesake monster rides along.



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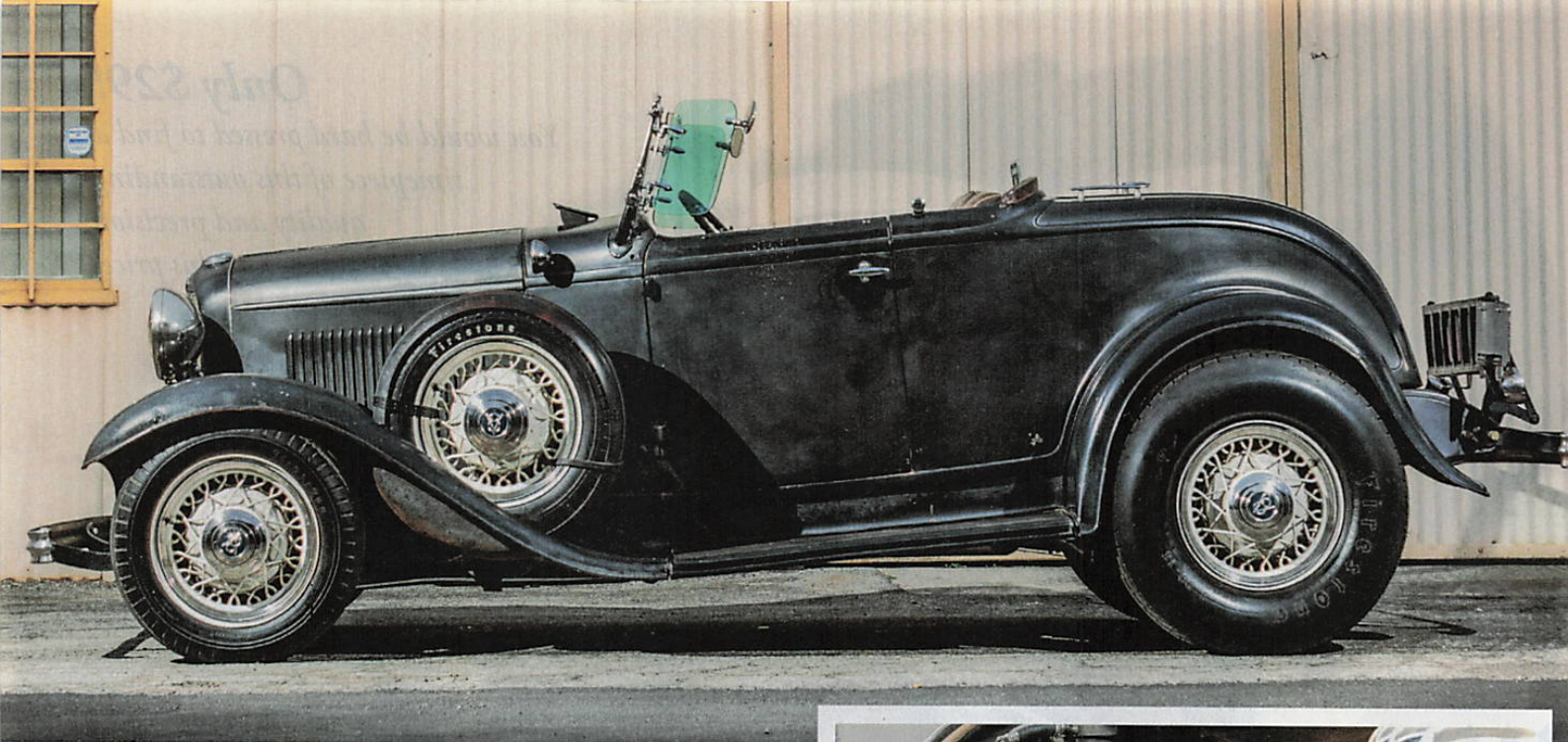
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COOKIE'S '32

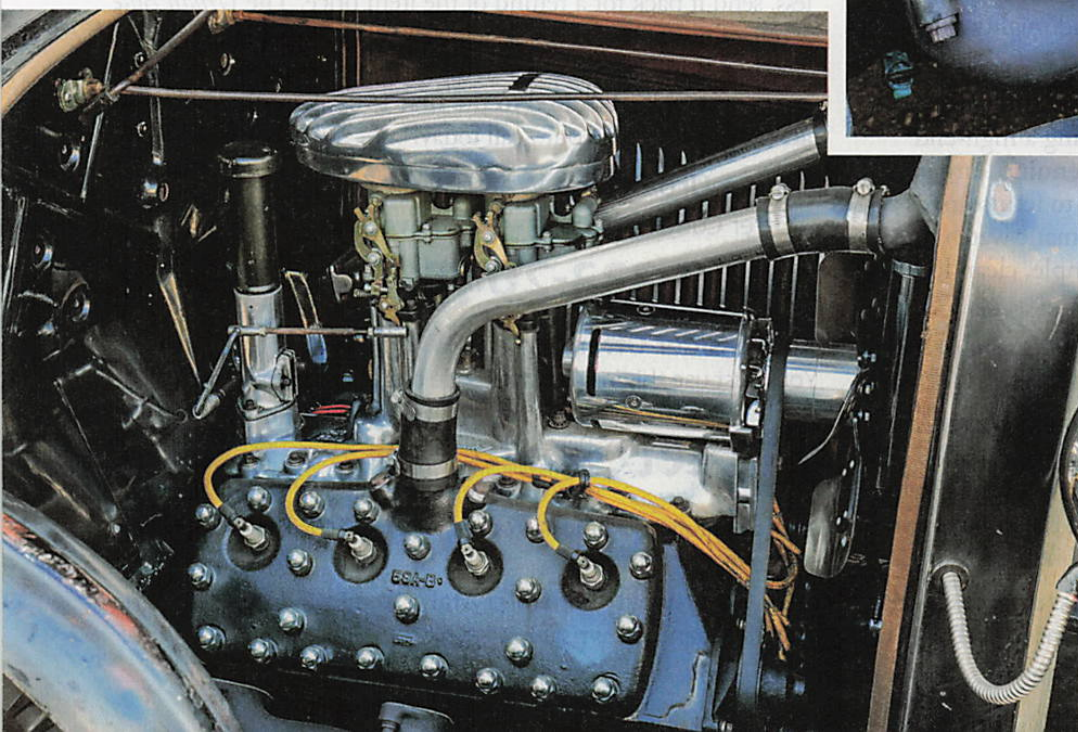
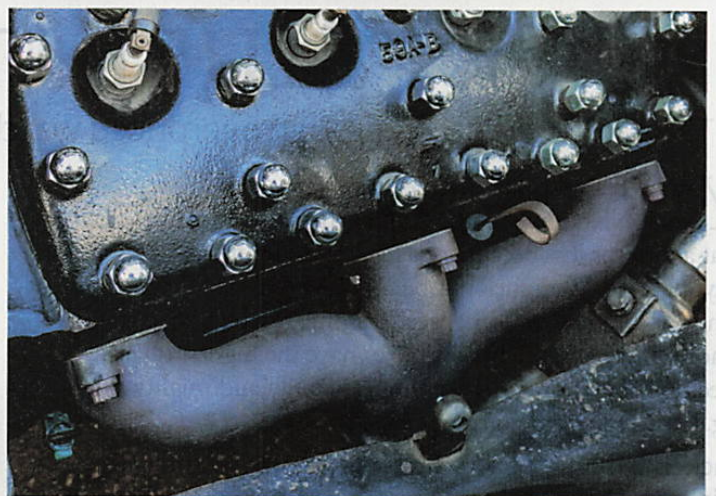
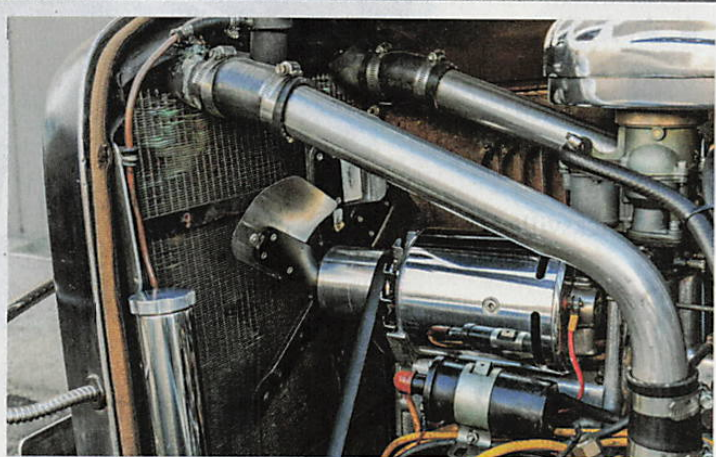
On his deathbed in 2011, Cookie made Jeff and his brother, Rick, promise not to paint the car. "Make it a highboy, do whatever you want, just don't paint it," he told them.

Jeff laughs, "Rick once had a nightmare that Dad visited us, and he was pissed because we had painted the car banana yellow."

Cookie bought the car as a project—a body and frameraills. Its most distinctive feature, the dual sidemount fenders, came as a thank-you from a hot-rodding buddy of his. "A friend of my dad's asked him to help go through this big parts stash, looking for '33 parts," Jeff explains. "As payment, Dad was able to take some '32 parts." In addition to the sidemount fenders, Cookie also scored a rare rear rack that came off an Australian phaeton. "It opens differently from a U.S. model," Jeff explains.

All the sheetmetal on the car is gennie Ford steel. In fact, just about every bit on the car, from the bumpers to the footpads on the fenders and even the wood around the back of the cab, is authentic Ford equipment, much of it original to the car. "My dad revered Henry Ford so much he built a car that, though it's still a hot rod, Henry Ford would get it if he saw it."

That "still a hot rod" part is obvious by the car's rake, achieved with an ancient 3½-inch dropped axle in front, a "1937-ish" rear axle with a ladder-bar setup fabbed by the Kennedy Brothers Bomb



Top: That rake! A vintage dropped axle gets the nose down; big-and-little Coker Firestones on Kelsey-Hayes bent-wire wheels accentuate what the hardware achieves. **Above:** Cookie built the roadster with a 21-stud flathead fed by a Thickett dual-carb intake. After he passed, family friend Mike Gilbert built a 59AB motor to replace it. He and Jeff moved the older engine's accessories onto the "new" flathead. The unusual-looking exhaust manifolds are actually headers off of a '30s Miller Indy car engine. Another of Cookie's swap-meet finds, they give the flathead a distinctive tone. **Left:** Topping the Thickett intake manifold are a pair of Edelbrock carbs and a Thickett air cleaner.

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COOKIE'S '32

Factory, and big-and-little Coker-reproduction Firestones wrapped around 16-inch Kelsey-Hayes bent-wire wheels.

Hot rod heritage carried over under the hood. Cookie installed a 21-stud flathead that wore a twin-carb intake and air cleaner made by Thickstun. The "rarest parts on the engine," Jeff says, were its exhaust manifolds, 2-1/8-inch "monsters" from a mid-'30s Miller Indy car. "Dad got them at the swap meet that used to be held at La Mirada."

Even with the hopped-up flathead, though, Jeff says the roadster "was just a family car. When he coached Little League, he'd take members of the team home in it, with kids hanging off the running boards. He used to do the swap meets, hanging out with friends at Pomona. And then he parked it, and that was that."

Wait, what?

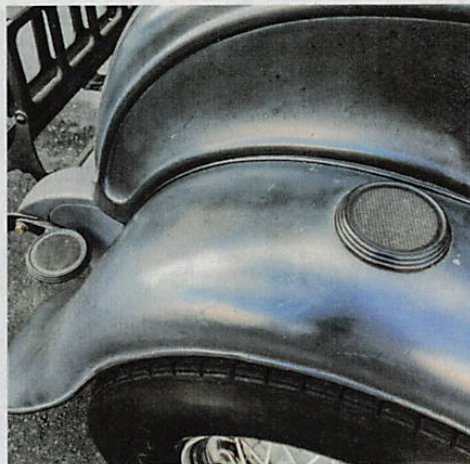
"Dad had a lot of trouble with that 21-stud flathead," Jeff explains. "He would say, 'This is a lot of work for a piece of sh*t.'"

It was a love-hate thing." In the mid-'70s the engine blew a head gasket, and when he tried to get the head off to repair it, a head stud broke. "He said to the car, 'If that's how you want to be, you can sit until I'm ready to work on you again.'"

And sit it did—for more than 30 years. What finally motivated Cookie to work on it again was an invitation to take part in the Deuce Week celebration of the '32 Ford's 75th anniversary at the Petersen Museum in 2007.

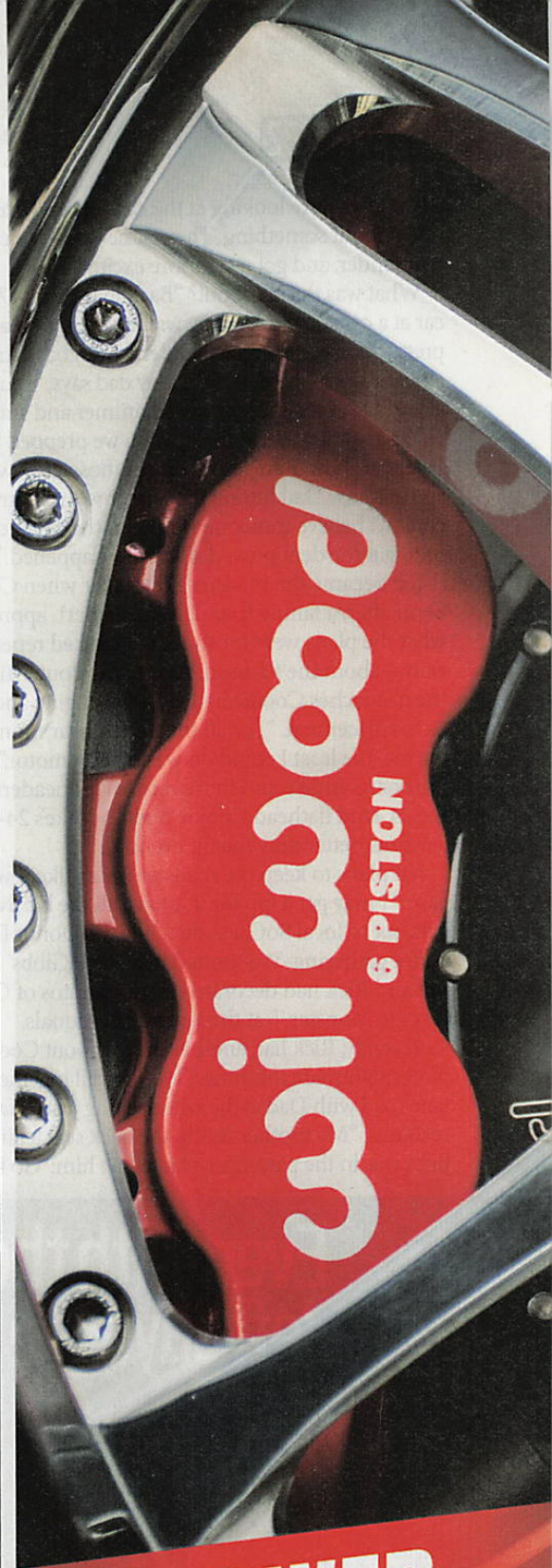
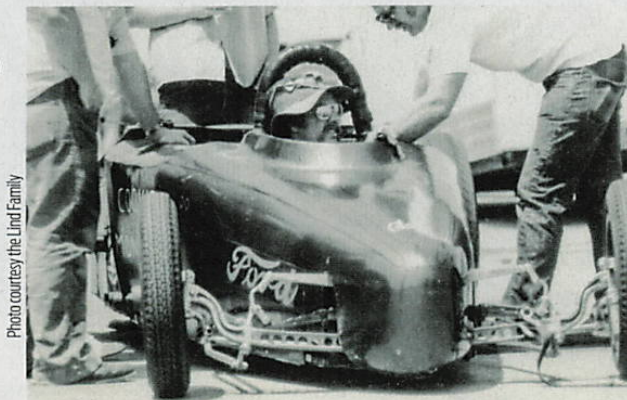
"She wasn't happy about being put away for all those years," Jeff recalls of the time he spent working with Cookie to get the car ready. "I was a carpenter and a painter, but I learned mechanical patience on this car. She fought us. When one problem got fixed, two more cropped up. I told dad, 'She's a lady; you can't just jump on her and drive her away. She wasn't going to be happy until she's done right.'"

At the Petersen Museum, Jeff remembers,



■ **Above:** Cookie working on the roadster prior to the Deuce Week celebration of the '32 Ford's 75th anniversary at the Petersen Museum in 2007. **Above right:** The roadster retains its rumble seat and the original footpads.

Right: Cookie's '27 T drag car, Cookie Monster, was originally built by Bean Bandit Joaquin Arnett. That's racer/collector Jim Lattin leaning in to talk to Cookie in the cockpit.



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COOKIE'S '32

"Two guys were looking at the car, one guy excitedly talking to the other about something. They came up to the car, looked at the right rear fender, and got even more excited."

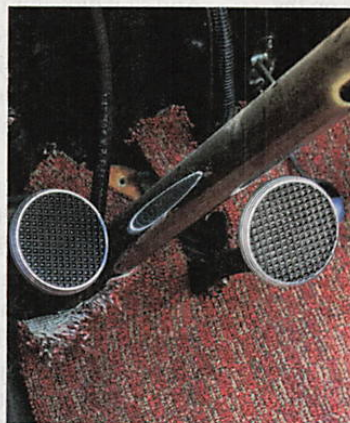
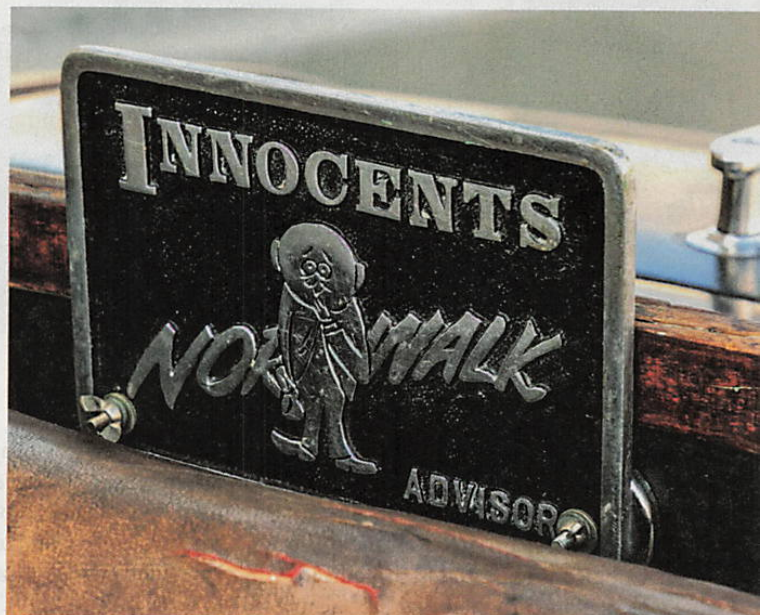
What was that all about? "Back in the mid-'70s, my dad had the car at a car show, and a guy walked up to him and said, 'Those are pretty good for fiberglass fenders.' Even back then, it was hard to find straight Deuce fenders. Well, my dad says, 'You think these are fiberglass?' He gets out a ball-peen hammer and smacks the fender with it."

"That dent was still there when we prepped the car for the Petersen show. It turns out one of those guys was at that show years ago and saw Dad hitting the fender with a hammer. His buddy couldn't believe someone would hit their Deuce's fender with a hammer, but the dent proved it actually happened."

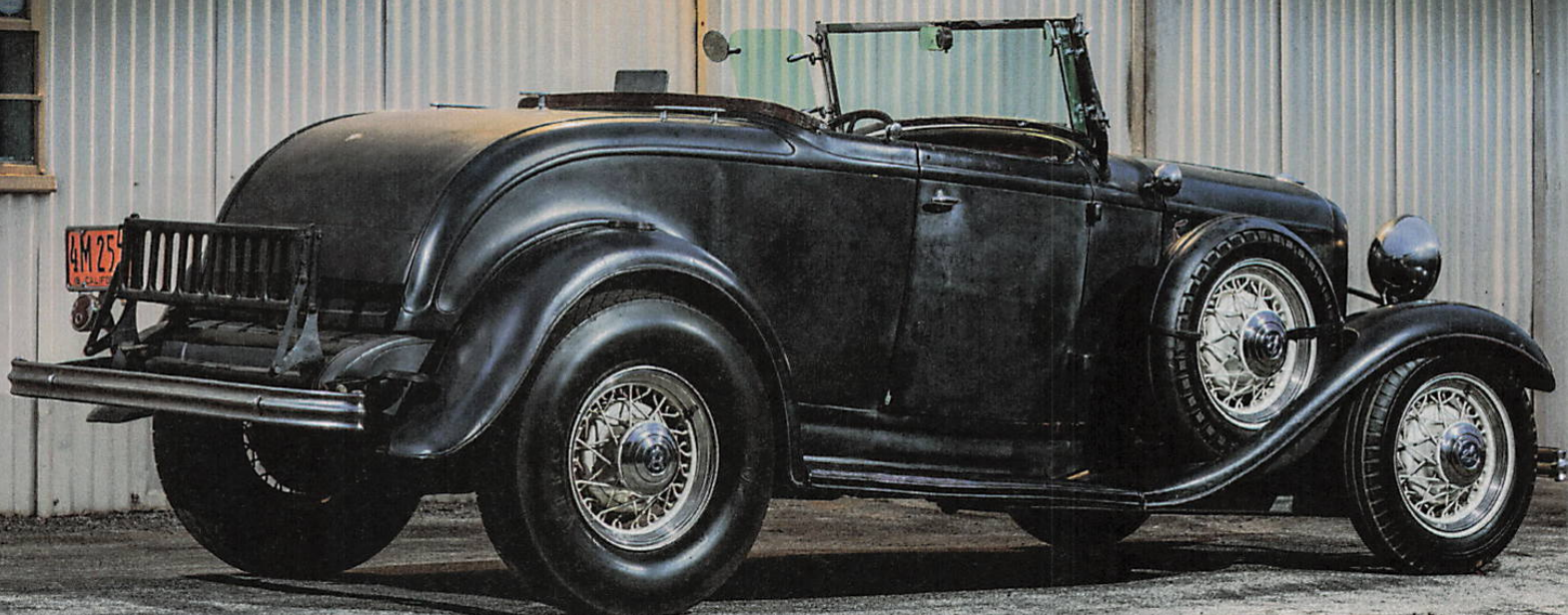
Jeff became the roadster's caretaker when Cookie passed in 2011. Soon after, a family friend, Mike Gilbert, approached him asking what the plans were for the car. He asked repeatedly—and specifically—about the flathead. As it turned out, Mike was well aware of the headaches Cookie had with the engine and had built a 59AB as a replacement. "For all the things your mom and dad have done for me, the least I could do was build a motor," Mike told Jeff. The Thickstun intake and those rare Miller headers were moved from the 21-stud flathead Cookie built to Mike's 24-stud engine, and the car runs better now than it ever did.

Jeff plans to keep the roadster much like it was under Cookie's care. "I may get a top for it. I have all the hardware," he says. And it gets out to local SoCal shows, like the Donut Derelicts cars-and-coffee gathering. We spotted it at Steve Gibbs' Nitro Revival, where Jeff and Rick had decorated it with photos of Cookie racing his Cookie Monster T at the Antique Nationals.

Recently, Rick had another dream about Cookie and the roadster. Not a nightmare this time. "We were all together driving down a two-lane road with Dad at the wheel, going just as fast as he could," Jeff recounts. "My brother was in the back seat telling him to slow down, but I was in the passenger seat telling him: 'Go faster! Faster!'" **HR**



Even with the hopped-up flathead, though, Jeff says the roadster "was just a family car."



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SUPERMAN

The Last Unshackled American Muscle Car

✍ Jerry Heasley 📷 Jerry Heasley & Doug Perry



In the summer of 2018, the faithful dropped their collective jaws when a Yenko collector named Doug Perry revealed that, after nine years of pursuit, he was fortunate to purchase a one-owner 1967 Yenko Camaro, rarest of the three years of production (1967 to 1969). What was the story? How did this 1967 coupe, born to race, have such low miles? How well preserved was this car? Did it have its original 427?

The Camaro's original owner, John Weaver of Greensburg, Pennsylvania, repainted his Nantucket Blue Yenko red in October 1968, six months after purchasing it the previous spring. That's why when Perry bought YS760 (YS for Yenko Serial number, 7 for 1967, and 60 for the 60th and last built for the model year), it had to be stripped to bare metal.



AT A GLANCE

1967 Yenko Camaro
Owned by: Doug Perry
Restored by: Arone Restoration,
Homer City, Pennsylvania
Engine: 427ci/410hp V8
Transmission:
TH400 3-speed automatic
Rearend: GM 12-bolt with 3.73
gears and Positraction
Exterior color: Nantucket Blue
Interior: Red Deluxe vinyl
Wheels: 15x6 Rally
Tires: G70-15 Firestone Wide Oval
Super Sports
Special parts: Yenko conversion
YS760, cowl plenum air cleaner,
power windows, fold-down rear
seat, AM/FM radio, original docu-
mentation (including registration
and Protect-O-Plate) and keys
7,257 original miles

SUPERMAN

Weaver's late purchase is a key to this car's unusual build, perhaps more so than the car's 7,257 original miles. One complements the other in a way that benefits history. How fortunate that one of the great Yenko builds of all time was saved in a heated garage since 1973!

The last Camaros without smog pumps were 1967 models built in Norwood, Ohio, the assembly plant of every Yenko. By contrast, every 1968 and 1969 Camaro would come with an Air Injector Reactor (AIR), consisting of a pump with a compressor and hoses.

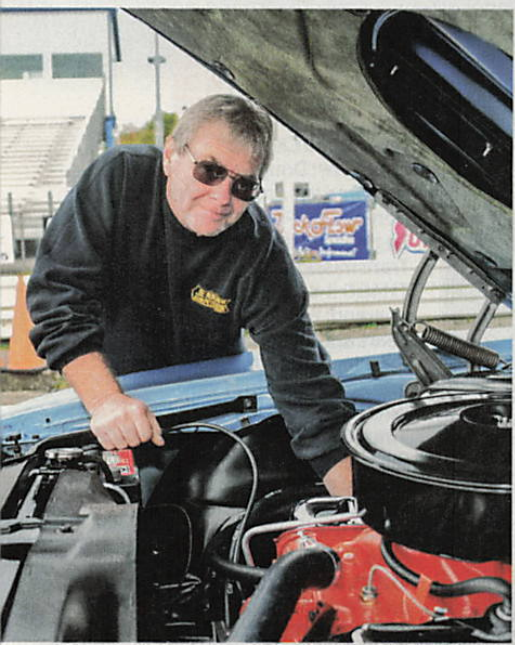
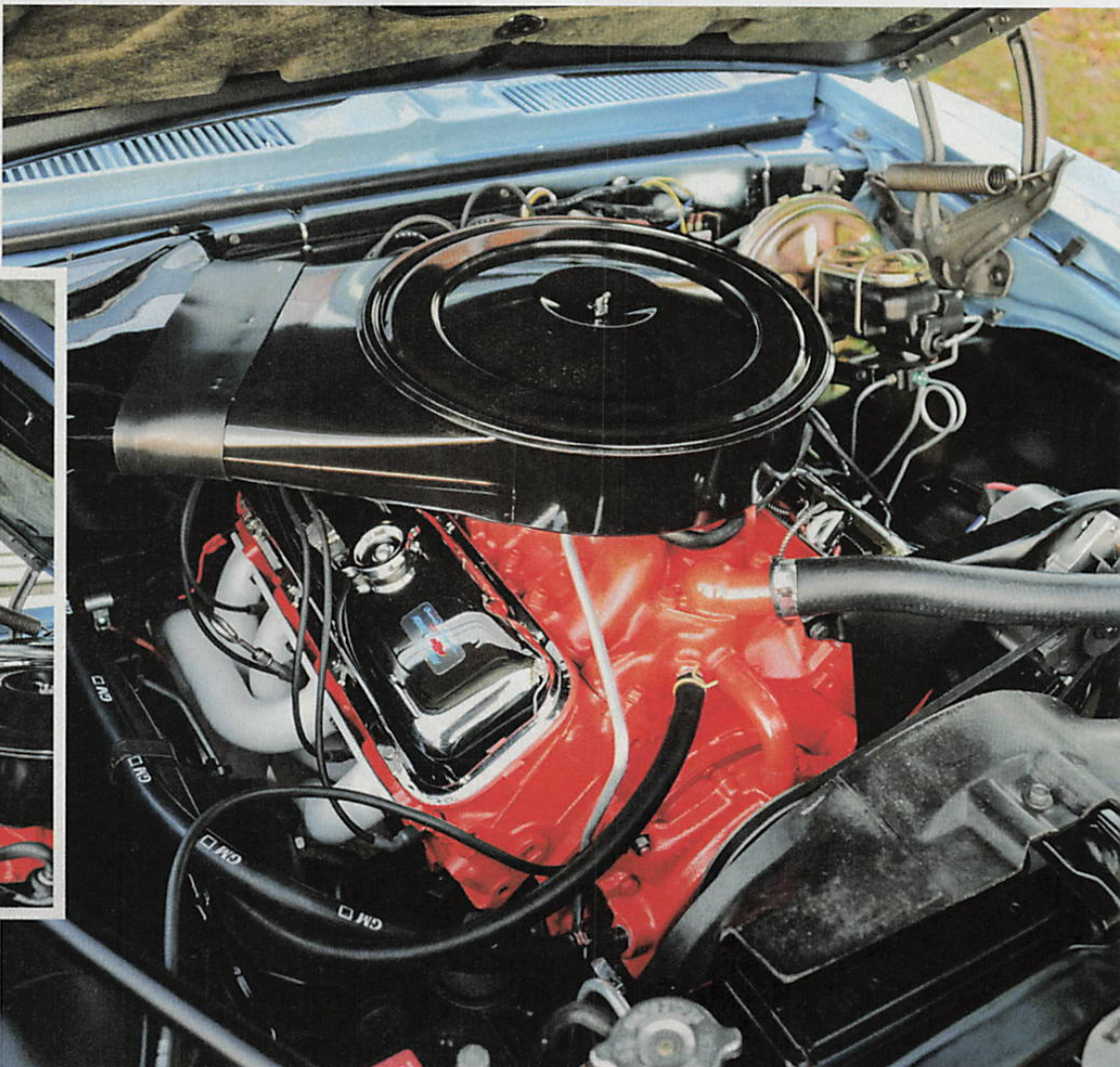
Just 19 at the time, Weaver remembered Don Yenko telling him, "This is the last car that we can make that's not going to have all this emissions equipment, and I just love these cars." So, is this Yenko the last *real* muscle car of the '60s, unfettered by power-robbing emissions equipment?

It was with this enthusiasm, we believe, and not just as a salesman, that Don Yenko sold this very last 1967 Yenko Camaro in the spring of 1968. Don promoted this car, which shows in the highest sticker price ever tallied for a Yenko Camaro: \$5,242.08.



Above and left: Here is the Camaro as it was found in John Weaver's garage, and as delivered to Frank Arone's restoration shop in 2018.

Below: The engine was originally a 325-horse 396 in this SS/RS. Yenko swapped it out for the 390-horse, 427 block, which was a Corvette motor (the 351 casting), featuring a larger bore and thus more cubic inches. The Yenko 427 build also got the Corvette crank and cam (still hydraulic); but otherwise used the intake, carburetor, and accessories from the 396. The Doug's headers were a suggestion by Don Yenko.



Dave McGaffee rebuilt the 427. Given its low miles it might have been fine, but Perry and restorer Frank Arone preferred to make sure of the engine's integrity after so many years.



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SUPERMAN

Weaver was after a Yenko Camaro in March 1968. The sales person, Ron Lane, told him "They weren't prepping them yet," in reference to the upcoming 1968 edition of the car, so Lane tried to sell him one of about 50 Z/28s on the new car lot. Weaver had his mind set on a big-block, however, so Don Yenko took over and told Weaver to, "Come around to the back lot." Under a tarp was a leftover 1967 model that they had not yet converted. The car had an odd color combination—Nantucket Blue with a red Deluxe interior—a showy combination that collectors love today, but may be why this Camaro had remained unsold in March 1968. This car gave him one more shot at producing a Yenko Camaro with no smog equipment, and history reveals he produced a real doozy. The Weavers had a 1965 SS Chevelle to trade in, for which Don gave them a whopping \$2,050, perhaps an overture to help with the Camaro's colossal price tag as the options kept adding up.

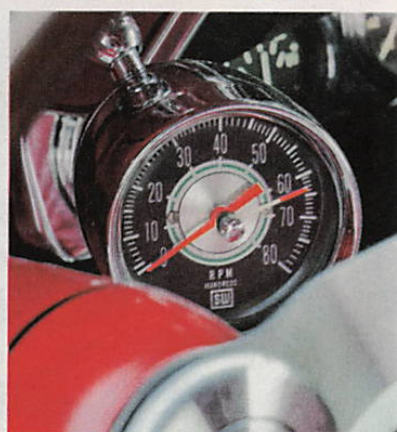
Yenko created a masterpiece of hot rod engineering, which in 1967 was invoiced brand new from Chevrolet, same as any other Yenko of the day, but more exotic, we believe, than any other Yenko that Don ever put together.

The hood had already been removed from this car, as well as the air cleaner. Don explained, "We needed some parts."

"I said, 'OK, but can you put a '68 SS hood on there?'" Weaver recalls. "Don said yes, then tried to talk me into a fiberglass hood that was like one of those Stinger hoods."

Too bad Weaver didn't say yes to the Stinger, for this Yenko would have been an even wilder creation. But Weaver was already spending a ton, so he opted to save \$150 on the Stinger hood and another \$150 on one other Don Yenko suggestion—a fiberglass decklid spoiler.

The lack of an air cleaner proved another example of turning a negative into a muscle car positive in the form of a 1968 SS hood, bumped up even more



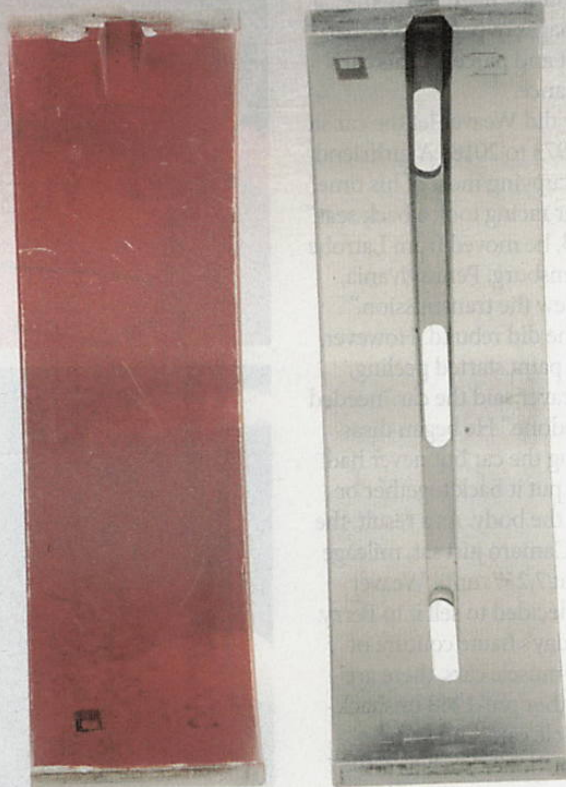
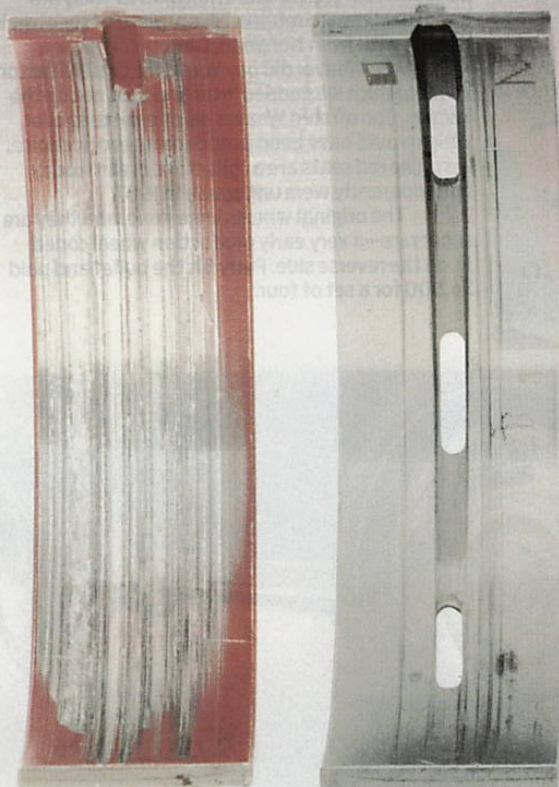
Perry suspects Don Yenko special-ordered this Camaro, perhaps for his parents or a customer, because it has the Deluxe interior, a fold-down rear seat, tilt wheel, wood-rimmed steering wheel, electric windows, and an AM/FM stereo with four speakers. The Yenko's original Stewart-Warner tachometer was found in a box and is now back in the car. This SW gauge package also turned up in Weaver's garage, and it, too, is back home in the Camaro.

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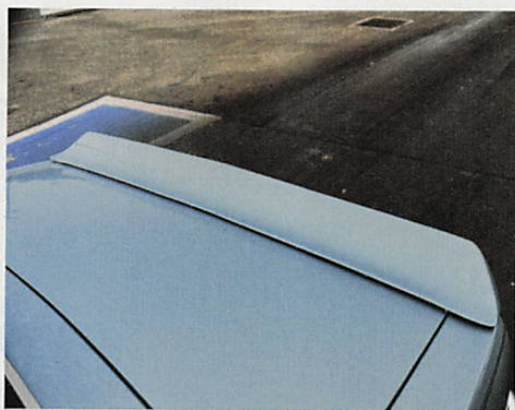
SUPERMAN

with a cowl plenum. It provided higher performance, of course, but also proved to be unique not just to the Yenko Camaro, but to the entire production run of 1967, 1968, and 1969 big-block Camaros. Only the Z/28 in this first-generation Camaro came with cowl induction.

Today, Doug Perry likes to bait Camaro cowl-induction gurus with the question of whether or not there is such a thing as a big-block cowl-plenum Camaro. When they say no, he likes to respond, "I have it in writing," referencing the seven pages of paperwork that are part and parcel of this car's provenance.

Why did Weaver let the car sit from 1973 to 2018? A girlfriend was occupying most of his time, and "car racing took a back seat." In 1973, he moved from Latrobe to Greensburg, Pennsylvania, and "blew the transmission," which he did rebuild. However, the red paint started peeling, and Weaver said the car "needed to be redone." He began disassembling the car but never had time to put it back together or repaint the body. As a result, the Yenko Camaro just sat, mileage frozen at 7,257, until Weaver finally decided to sell it to Perry.

In today's haute couture of vintage muscle cars, there are many other pre-1968 unshackled muscle cars, and some would be hotter, such as a 1967 L88 Corvette or a 1967 Shelby Cobra roadster. None were produced as late as YS760. **HR**



Above: This is a 1968 hood, which is stock on this 1967 Camaro. Why? Because that's the way Yenko built and sold the car brand new. Other than the hood, the Camaro retained every piece of sheetmetal it came with from Norwood, Ohio.

Above left: Weaver did pay Yenko for this GM factory spoiler, which was added later and thus not on the invoice. Don offered Weaver his one-piece spoiler, which would have been a much more exotic choice.

Left: The red seats are a collector's dream today but apparently were unpopular in 1967.

Below: The original wheels were gone, and they are super rare—a very early production wheel coded JK on the reverse side. Perry bit the bullet and paid \$4,500 for a set of four.



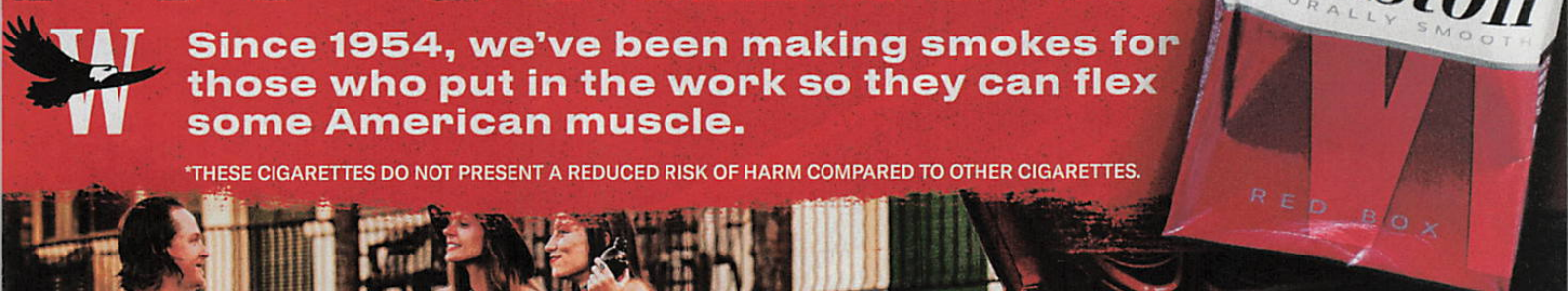
Left: Along for our "Return to Keystone" are, from left to right: Dave McGaffee, Matt Lamer, Frank Arone, Doug Perry, Matt Barczak, and John Weaver. Doug Perry thought it fitting to bring the Yenko Camaro and its original owner, John Weaver, to Keystone Raceway Park, where Weaver raced the car.

Right: The old Yenko dealership building is still in Canonsburg, Pennsylvania but the Yenko name is gone. The dealership moved to another location in town in 1972. Doug Perry wanted to bring the car home to Canonsburg, but due to rain we left the car in the trailer.





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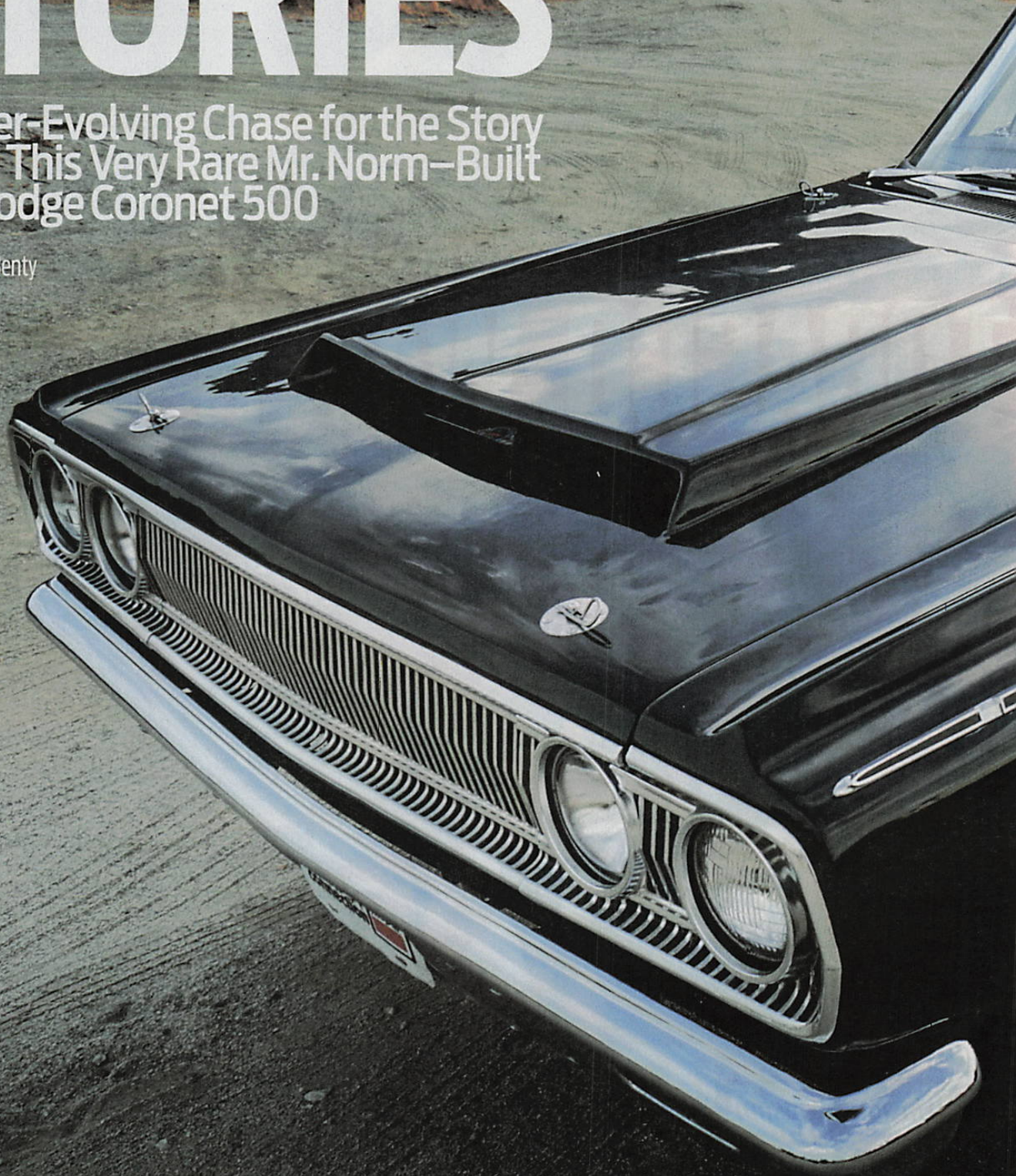
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DODGE STORIES

The Ever-Evolving Chase for the Story
Behind This Very Rare Mr. Norm-Built
1965 Dodge Coronet 500

  Cam Benty





■ The 1965 Dodge's body design was all new in every way, a major departure from previous Dodge/Plymouth bodywork. Mr. Norm sold this Dodge new with a 426ci Street Wedge engine and a four-speed transmission.

DODGE STORIES

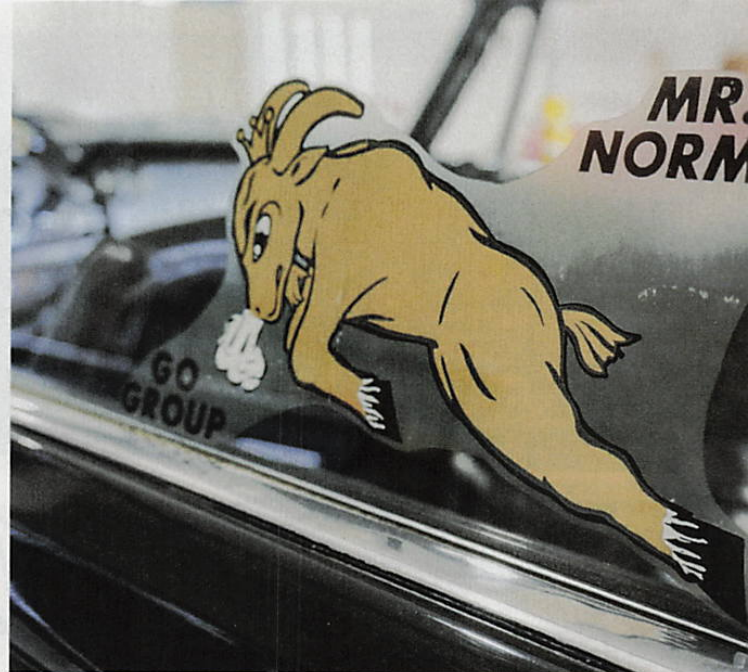
During the late '50s and '60s, the number of car dealerships jumped dramatically across the country. Manufacturers reasoned that if prospective buyers had a dealership in their neighborhood, they would sell more cars. In this Golden Age of American car production (1955-1970), some dealerships began to focus on performance cars as a way to generate additional traffic. Yenko in Pennsylvania, Motion in New York, Dana and Galpin in California, Royal in Michigan, and others all specialized in delivering high-powered cars to a thirsty public. Most importantly, car manufacturers took advantage of this specialization, creating unique cars with bigger engines and other performance options to help push cars off the lot.

For Mopar fans, no dealer was more performance-oriented than Norm Kraus's Grand Spaulding Dodge in Chicago. Opened in 1962 at the corner of West Grand and North Spaulding Avenues on the west side of Chicago, what started out as a dirt lot became the

place where "Hemi" and "Max Wedge" were spoken fluently, and black tire marks on the surrounding streets signaled a successful test drive. To that end, Mr. Norm's service department would performance-tune each car before delivery on their not one but two onsite Clayton dynamometers. It was not long before Grand Spaulding Dodge

became the highest-volume performance Dodge dealership in the U.S.

Along with the street-worthy high-performance Dodges that rolled off the lot, Mr. Norm believed that racing was good for business, and considered racing to be his favorite marketing tool. Together with his friend and fellow Chicagoan



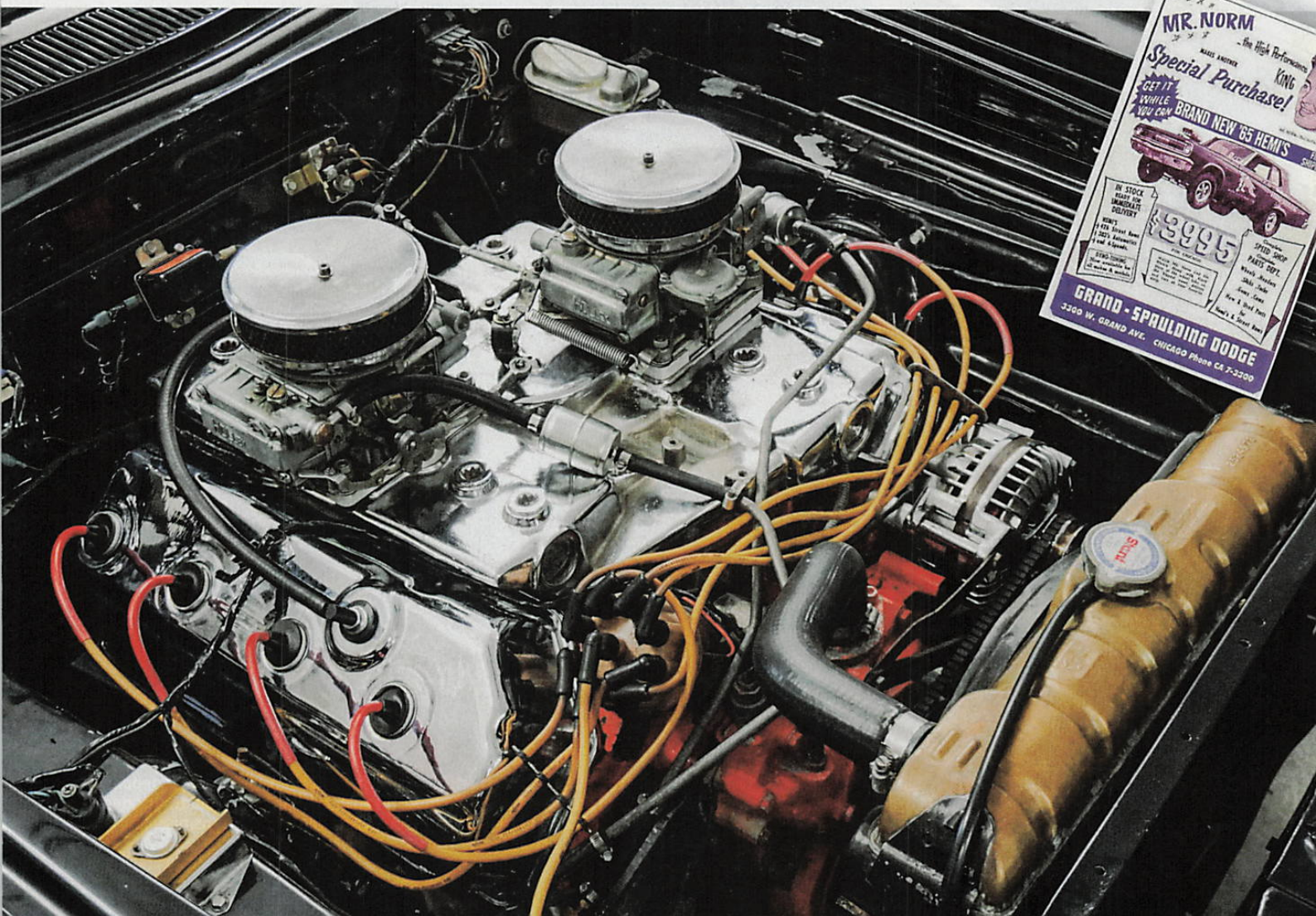
In the day, only cars sold by Mr. Norm received this cool decal. Back then, if you saw this on the car in the other lane, you knew the race was going to be interesting.

Gary Dyer, Grand Spaulding-sponsored race cars became a common sight on racetracks around the country for several decades. From factory Super Stock through Altered, Factory Experimental machines and on to nitro-burning Funny Cars, the "win on Sunday, sell on

Monday" mentality was in full force at Mr. Norm.

Racing and performance cars drove sales of production cars in the '60s and into the early '70s. To feed the frenzy, Mr. Norm offered racing parts that were prototyped in its facility for racers worldwide. In kind, Chrysler

This 1966-model 426ci engine slipped between the fenders of the Dodge sometime after its creation. It is topped by a pair of cool Holley carbs on a classic, chromed cross ram intake manifold.



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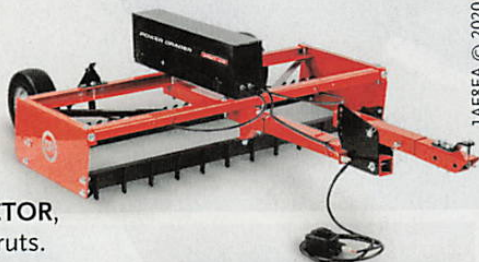
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DODGE STORIES

began offering these parts for sale to other dealerships and customers. Specialty racing-oriented engines, lightweight body parts, and stronger suspension and drivetrain parts all brought a higher level of clientele that would generate money for these “enthusiast” products. So, what does that mean for Brad Toles, owner of this 1965 Dodge Coronet 500? Its history makes this car unique. It was originally built with a 426 Street Wedge engine and delivered to its first owner at Grand Spaulding Dodge. Some time later, the 426 Hemi was installed, along with the '70-era Dana 60 rear axle.

Chasing Its Roots

To chase down additional information concerning how

Toles' Dodge came to be, we turned to longtime Mr. Norm vehicle expert Larry Weiner, who to this day carries on the work of the famous Chicago dealership. (In fact, if you want to create the ultimate late-model Dodge, Charger, or Challenger, Weiner will take your order and build you a documented, certified, tire-melting machine. Check him out at www.mrnorms.com.)

So we sent the photos that you see here over to Weiner and asked a few questions about how this car may have come to its current form. Weiner was a racer back in the day and knew all the players, including Kraus and Dyer. Over the years he has seen quite an assortment of cars, but delivered a sad fact that was to make the rest of our investigation considerably tougher.



■ The clean design of the 1965 Dodge was a major change from preceding years. Performance fans will note the huge McCreary tires that tuck neatly inside the wheelwells. The front end might, on first review, appear to be standard issue with a big functional hood scoop. In reality the fenders and hood are all fiberglass—this is a real factory Mopar lightweight front end.

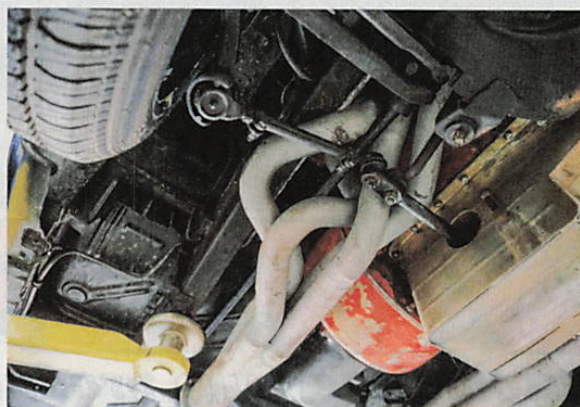
“A fire destroyed all of the paperwork surrounding the legacy of Mr. Norm’s car sales in 1968,” notes Weiner. “For that reason there’s no way to tell if a car prior to that year was originally ordered by the dealership. Even worse, there’s no way to tell how many cars were actually

created. This makes it hard to prove if any car came from the dealership unless the car retains the original sales documents. Even the stickers that the dealership would apply to the cars as they left the lot really hold no significance since reproductions are common.”



■ Left: While the underside of this Dodge has not been restored, it does make it seem all the more real. This Dana 60 rearend was installed after initial production and features 4.11:1 gearing.

■ Right: As was more common during that era, a hole built through the center of the Milodon oil pan allows the tie rod to work in the original position.

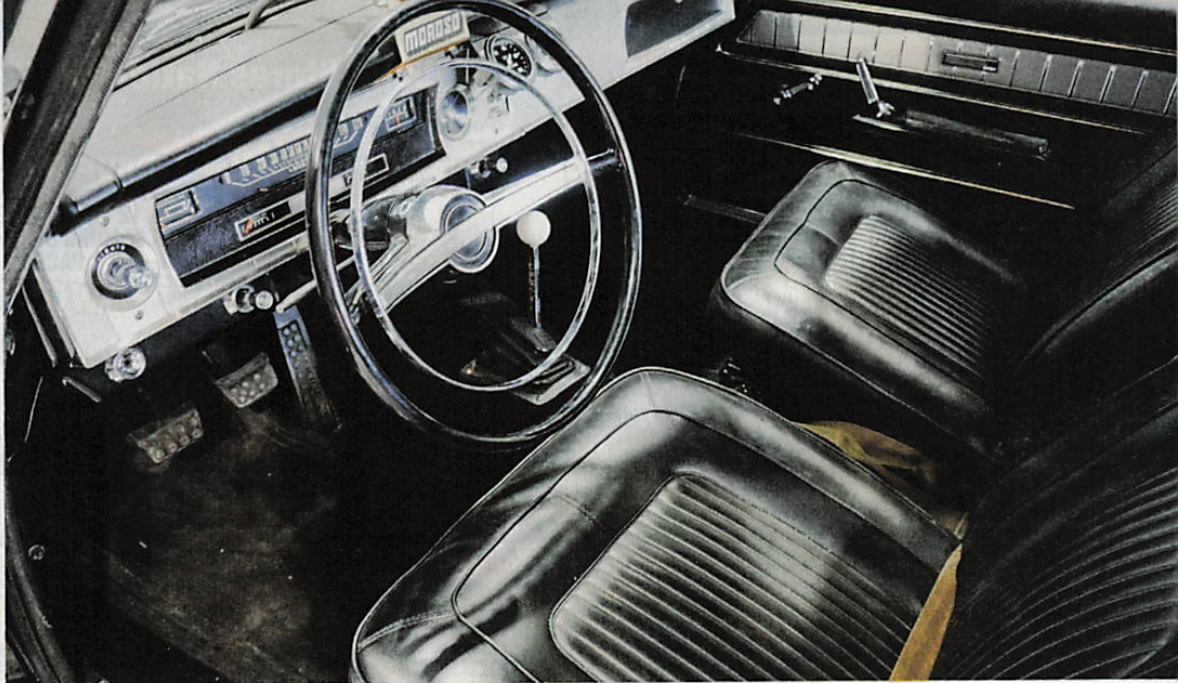


Toles' Dodge is one of the lucky ones. The original Grand Spaulding Dodge invoicing material is still with the car, including the all-important IBM punch card that was required to order the car from the factory. But it would require significant sleuthing to figure out the engine, body, and rearend changes made to the car.

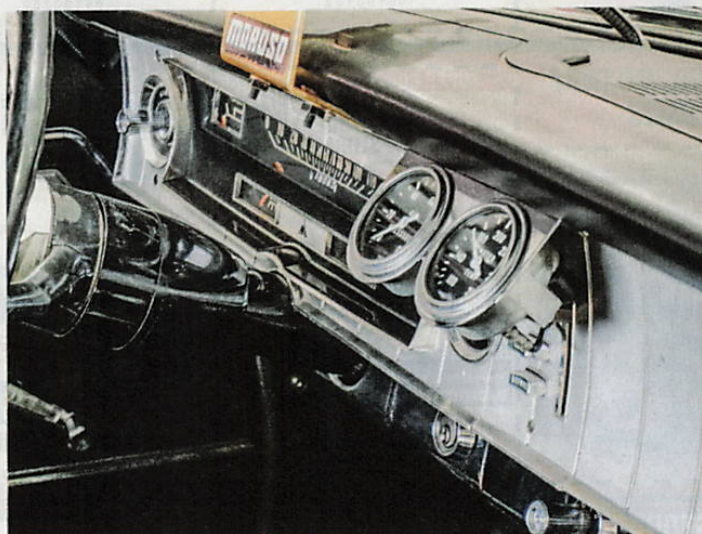
"It is clear that changes to the car, such as the rearend, were done sometime after 1970 due to the date coding on the part," continues Weiner. "The bell-housing is a hydro-formed unit with a block plate, which would have been popular around the early 1970s, the earlier cars used the Ansen cast iron units for clutch safety."

If the upfits to the Hemi engine were done in the 1970s, as would seem to be the case, then finding a 1965 Dodge K-member to accept a 1966 Hemi engine might not have been so easy. As our car demonstrates, the modifications required to make it fit were extensive. Weiner notes that Mr. Norm's shop used Milodon oil pans of this type on its builds, but so did a lot of other folks during the era.

"I made a call over to Norm Kraus, the original Mr. Norm, and asked him about the car," says Weiner. "He's 86 years old and still excited about cars. He believes that due to the crude nature of the cuts made to the

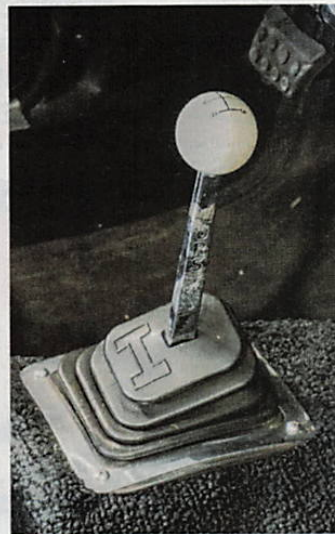


■ The interior of the Dodge features many of the standard items you'd find on any Mopar of this era, with the addition of the Moroso tachometer and the high-mounted gauges for coolant temp and oil pressure. That four-speed is factory issue but was fitted with a Hurst short-throw shifter system. The auxiliary gauges stand ready to report engine condition. Note the factory radio-delete dash panel. Originally a four-speed, this Dodge uses the factory A-833 four-speed transmission and Hurst shifting components.



K-member to fit the Hemi engine, that the upgrades would not have been done at Grand Spaulding Dodge. In addition, things like the rear welded

wheels would not have been used—most customers would have bolted up a set of Cragar S/S five-spokes and sent him down the road."



So will we ever know who was the "customizer" of the Hemi-powered Coronet? Time, and perhaps this article, will hopefully reveal that answer. ■

Fast Fasts

1965 Dodge Coronet 500 Brad Toles, Palm Springs, California

Engine

Type: 426ci Hemi; 1966 date code (original engine: 426ci Street Wedge)

Bore x Stroke (in.): 4.250 x 3.750

Block: 426ci Hemi block

Rotating assembly: Original Street Hemi engine components including factory forged crankshaft, rods, and aluminum alloy pistons

Cylinder heads: Original Mopar Street Hemi engine components

Compression: 10.25:1

Induction: Chrome-plated cross ram intake manifold with twin 600-cfm Holley carbs

Oiling system: Milodon high-volume race oil pan with high-pressure pump and internal windage tray

Exhaust: Hooker slip fit headers into twin mufflers and complete exhaust; car was originally equipped with fenderwell headers

Ignition: ACCEL ignition with Mopar regulator

Drivetrain

Transmission: Original New Process A-833; 18-spline input shaft

Shifter: Hurst 4-speed original

Driveshaft: Factory original

Reared: Original Dana 60 with 4.11:1 gearing, Sure Grip, date-coded 1970

Chassis

Front suspension: Factory original with factory-correct markings.

Rear suspension: Factory original with Hemi springs and HD shocks

Steering: Factory stock box, manual, no assist

Front brakes (in.): 10x2.5 factory drum brakes

Rear brakes (in.) 10x2 factory drum brakes

Body

Fiberglass front end: Perhaps Mr. Norm?

Paint: Factory/dealership paint

Paint Color: Factory black

Interior

Instrumentation: Factory original cluster radio-delete panel; Moroso Tach and auxiliary aftermarket gauges

Upholstery: Factory original-style vinyl bench seat

Wheels & Tires

Wheels: 5x15 steel wheels in front, 10x15 widened and welded steel wheels in rear

Tires: 205/70-15 Cooper Trendsetter Radial in front, P295/50R-15 McCreary Mini Star in rear

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T-HANDLE BALL END
HEX KEY SET

NOW \$12.99

COMPARE TO HUSKY \$32.10
MODEL: HTXSM14PCN

SAVE 59%

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29 PIECE
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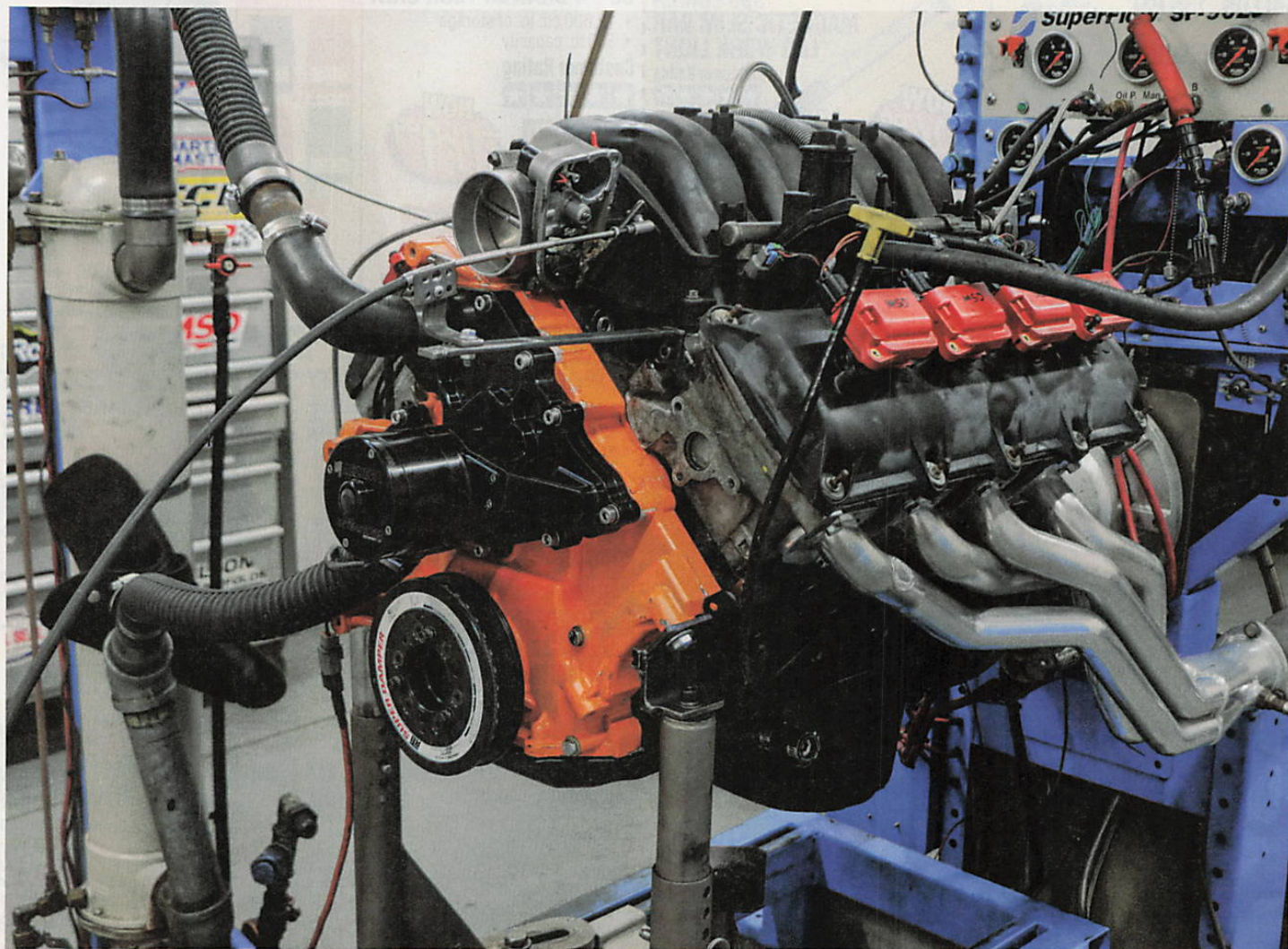
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The Homeless Hemi, Part 2

MORE CAM FOR THE RAM WITH 67 MORE HP AND NO LOSS OF GRUNT!

Richard Holdener

In Part 1, we introduced the Homeless Hemi, our 5.7L Hemi engine. This particular Hemi was shrouded in mystery for long ago, it had been cast aside and forgotten. Only recently did it reappear, but it was in such disarray that we no longer knew if it ran. In fact, we can't remember where it came from other than some online junkyard dismantler. The biggest question hovering over the Homeless Hemi was why were there so many pieces missing? Most of the big stuff was there, like the short-block and cylinder heads, but it was far from being in running condition. The missing parts list included a rocker set, valve covers, and oil pan. Also absent was the induction system, front cover, and sensor package. Despite the fact that we could



Our 5.7L Hemi originally came from a 2006 Dodge Ram. Run with the stock cam, Hooker long-tube headers, and a Holley HP management system, the engine produced 367 hp and 414 lb-ft of torque. After running the baseline test, we began the cam swap. First on the list was to remove the MSD coil packs.

nearly pick up a complete used Hemi for the price of these missing components (maybe why it sat for so long), we decided to solve the mystery and get it

running. In the process, we also added a little NX nitrous kit to up the power from 367 hp and 414 lb-ft to 495 hp and 530 lb-ft. With Part 1 completed, we now

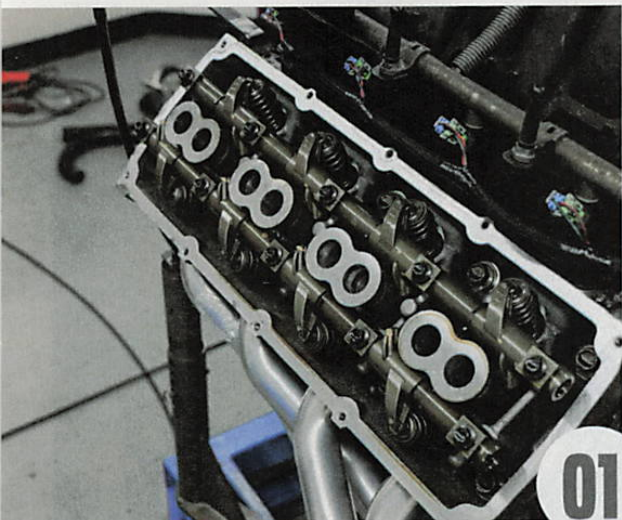
turn our attention to increasing the NA power output.

Hemi owners, even of the early version like our 2006, have one heck of a starting point. Much like LS owners, the Hemi responds very well to aggressive cam timing, because the engine is blessed with basically everything else needed to make big power. Having free-flowing heads certainly helps the situation, but the intake plays a big part as well. Even the lowly truck intakes (again like the LS) can support exceptional power, while maintaining impressive torque production thanks to

Sources

Comp Cams 901.795.2400
www.CompCams.com

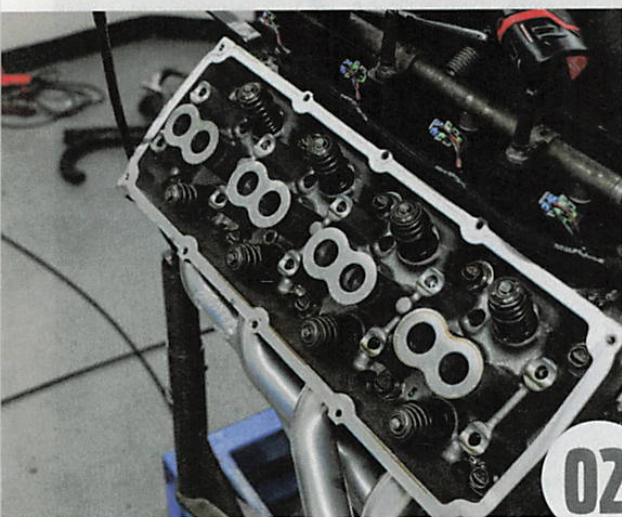
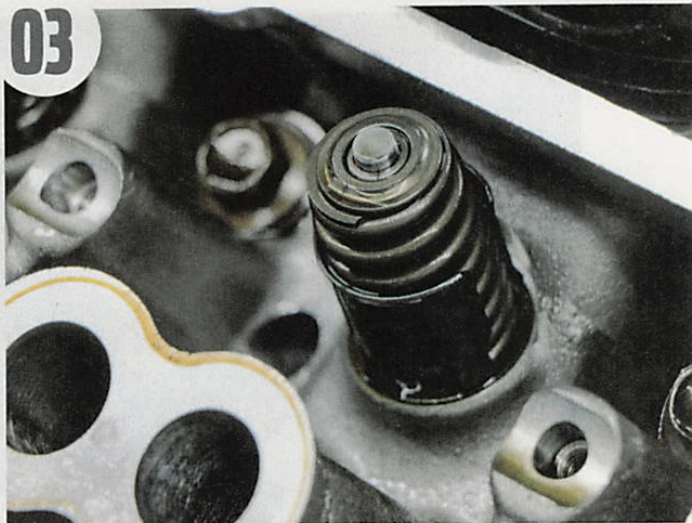
Holley/Hooker/MSD 866.464.6553
www.holley.com



01 Removal of the valve covers provided access to the rockers and valvesprings.

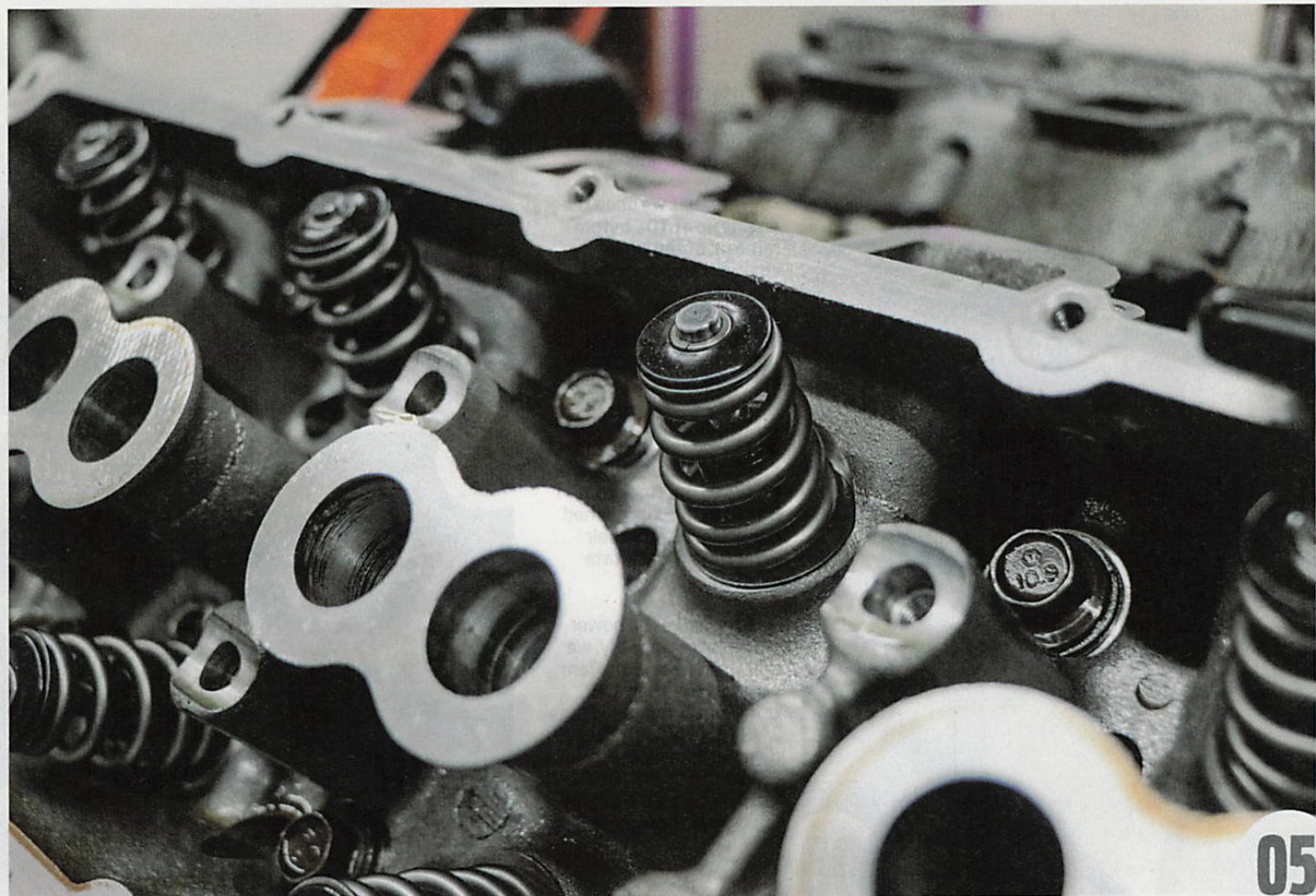
02 Off came the stock rockers and pushrods to allow installation of the new cam and replacement of the stock springs.

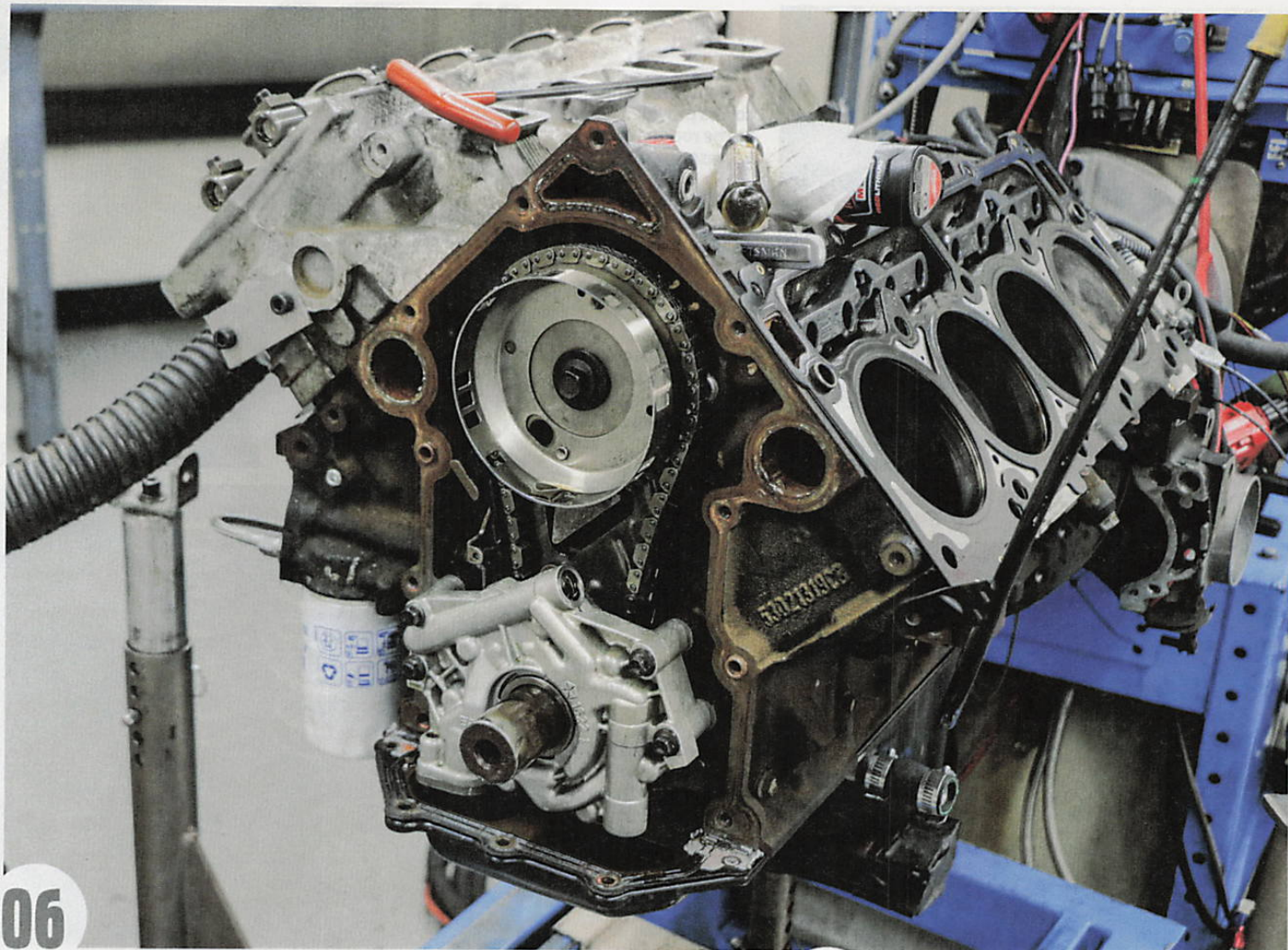
03 As we expected, the factory Ram springs were insufficient for our new Comp HRT cam profile.



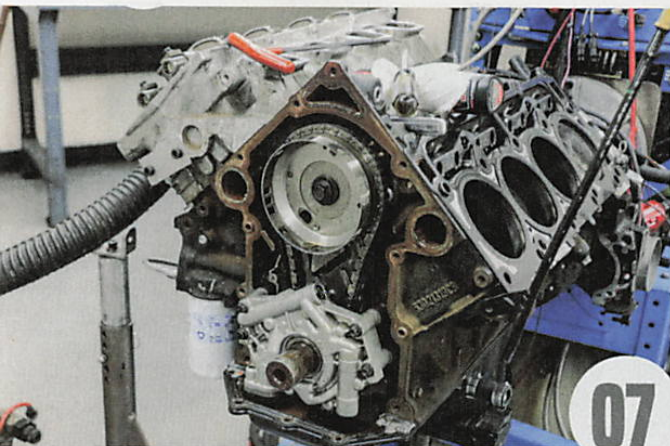
04 Comp Cams now offers a variety of different spring packages for the entire Hemi engine family, including the early 5.7L (like ours) and the later (2009-up) 5.7L "Eagle" and (2011-up) 6.4L "Apache" variants (shown).

05 We replaced the stock springs with a new set of 7228 springs from Comp Cams.





06



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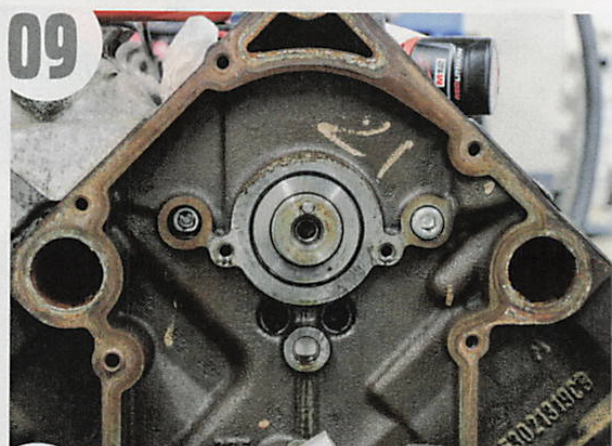
06 After the spring swap, we removed the damper and front cover to provide access to the timing gear.

07 Note that we lined the engine up at TDC before removal of the timing chain or cam.

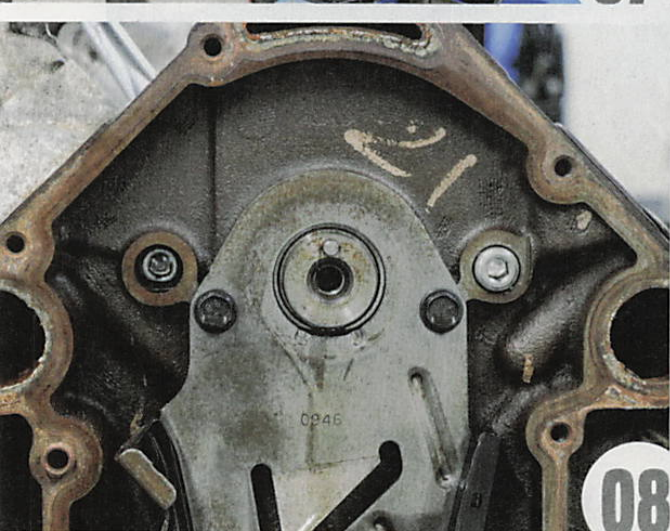
08 Removal of the cam gear provided access to the tensioner and cam retaining plate.

09 We removed the three bolts securing the cam retaining plate to provide access to the stock cam. Rotating the cam pushed the lifters up into their lifter trays to facilitate cam removal.

10 To improve the power output substantially, we replaced the factory Ram cam with this new HRT cam from Comp. The Stage 2 HRT cam offers 220/230 degrees of duration at 0.050-lift, 0.596/0.582-inch lift, and a 113-degree lobe separation angle.



10



08

their generous runner length.

With ample displacement and compression, the only thing stopping a Hemi from making power is the mild factory cam timing, especially on the Ram trucks. The mystery surrounding our Hemi was not so much would a cam swap increase the power output, but by how much? It should be pointed out that we were treading lightly, as these early Hemis were notorious for dropping valve seats. For most owners, it wasn't a matter of if, but a matter of when, and having a mystery motor only made things worse. Were we living on borrowed time? Would the whole thing explode in a fiery ball of piston parts? All we knew was that repairing the stock heads was out of the question (meaning budget), so we continued with our cam swap and hoped for the best!

Having already run the baseline with our nitrous test, we tore into the Hemi to replace the cam. The new Comp HRT profile we decided to run (0.596/0.582-inch lift, 220/230-degree duration, and 113-degree LSA) required a valvespring upgrade, so we installed a set of Comp 7228-16 springs. Comp offers no less than three different spring packages for the various Hemi generations, allowing users to select spring kits based on their intended cam lift. Comp Cams also introduced a spring compressor tool for the Hemi at SEMA, but it was not available in time for our test. Undaunted, we pulled the heads to replace the springs using a conventional compressor on hand at Westech Performance. Once the spring swap was complete, we continued with the installation of the new cam, a job that was easily accomplished on the engine dyno.

After installation of the new cam, we were excited about the power potential. You'll remember that our 5.7L produced peak numbers of 367 hp and 414 lb-ft of torque in stock trim with Hooker long-tube headers and our manual throttle body. The engine was plenty torquey, but we wanted to see this thing pull a little harder on the big end. The cam was just what the doctor ordered, as the Hemi thumped out an additional 67 hp with the cam swap. Equipped with the new HRT cam, the 5.7L produced 434 hp and 440 lb-ft of torque. We suspect that it was down slightly on power from where the old dog should be, both with the stock cam and the new Comp version, but we sure liked the gains offered by the HRT cam. It's hard to argue with an extra 67 hp, especially when the big gains on the top came with no penalty in power down low. Cam swaps can be tricky, as extra top-end power is often accompanied by a loss in low-speed torque, but it looks like the boys at Comp did their homework on the new HRT designs. What's next for the Homeless Hemi? It looks like his shopping cart is clattering ever closer with headers, intakes, and boost!

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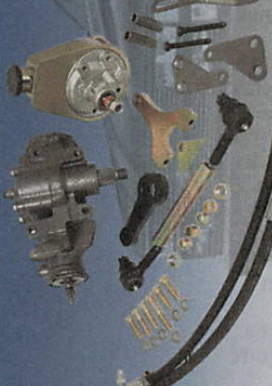
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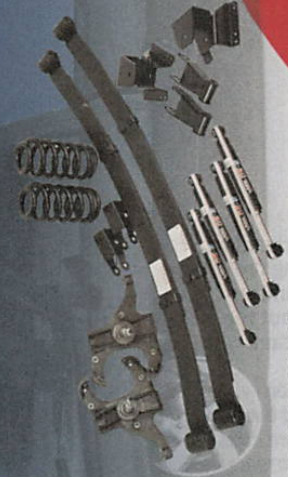
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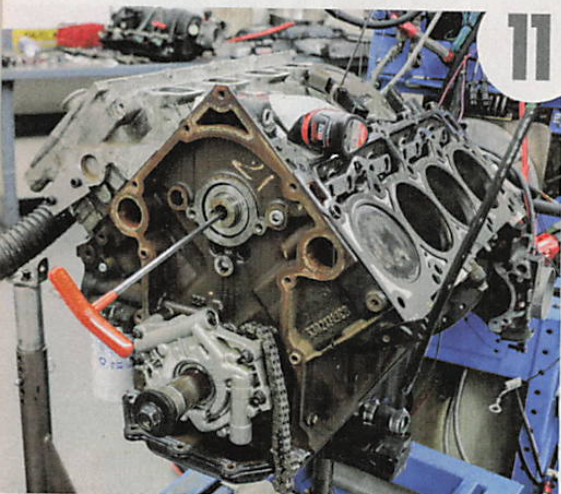
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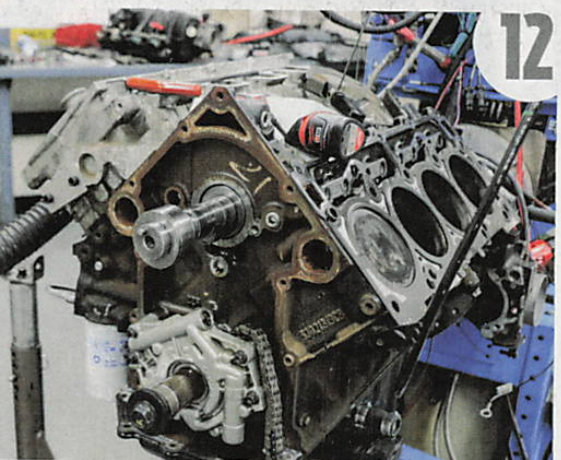
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11

11 After cleaning and oiling the Comp cam, we yanked out the factory cam.

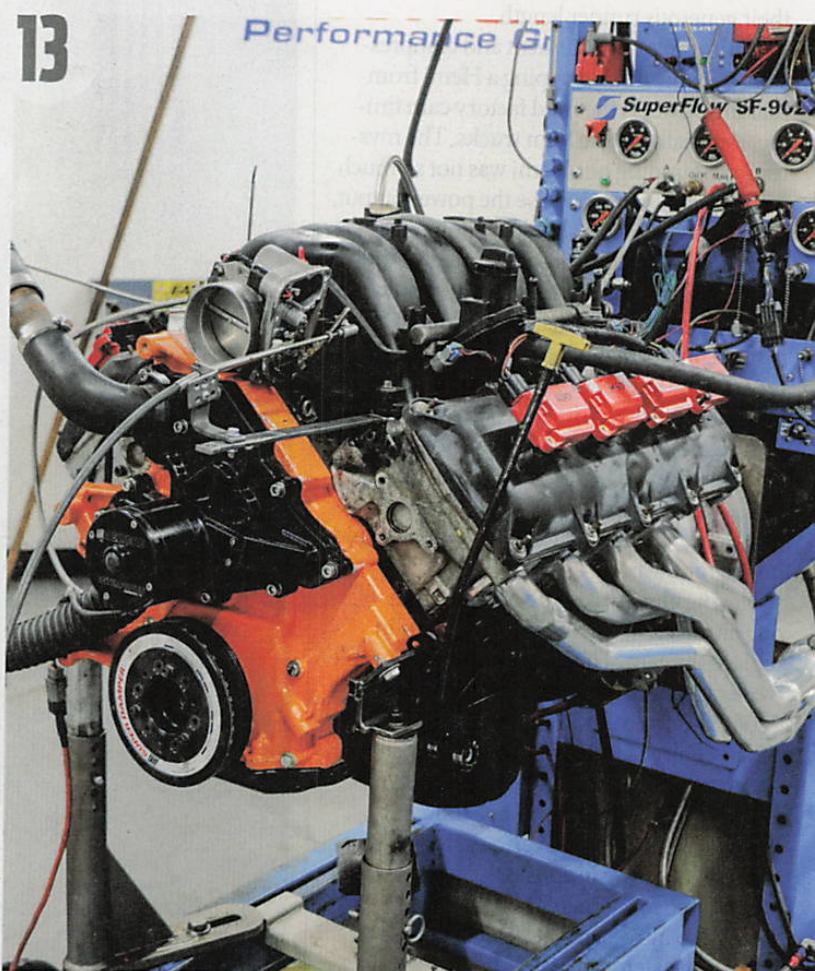


12

12 We then installed the new Comp cam in its place. We were excited about the power potential of the new Comp cam profile.

13 Run again with the new Comp HRT cam, our 2006 Ram truck Hemi produced 434 hp at 5,500 rpm and 440 lb-ft of torque. The Comp cam improved the power output by 67 hp and 20 lb-ft of torque!

13

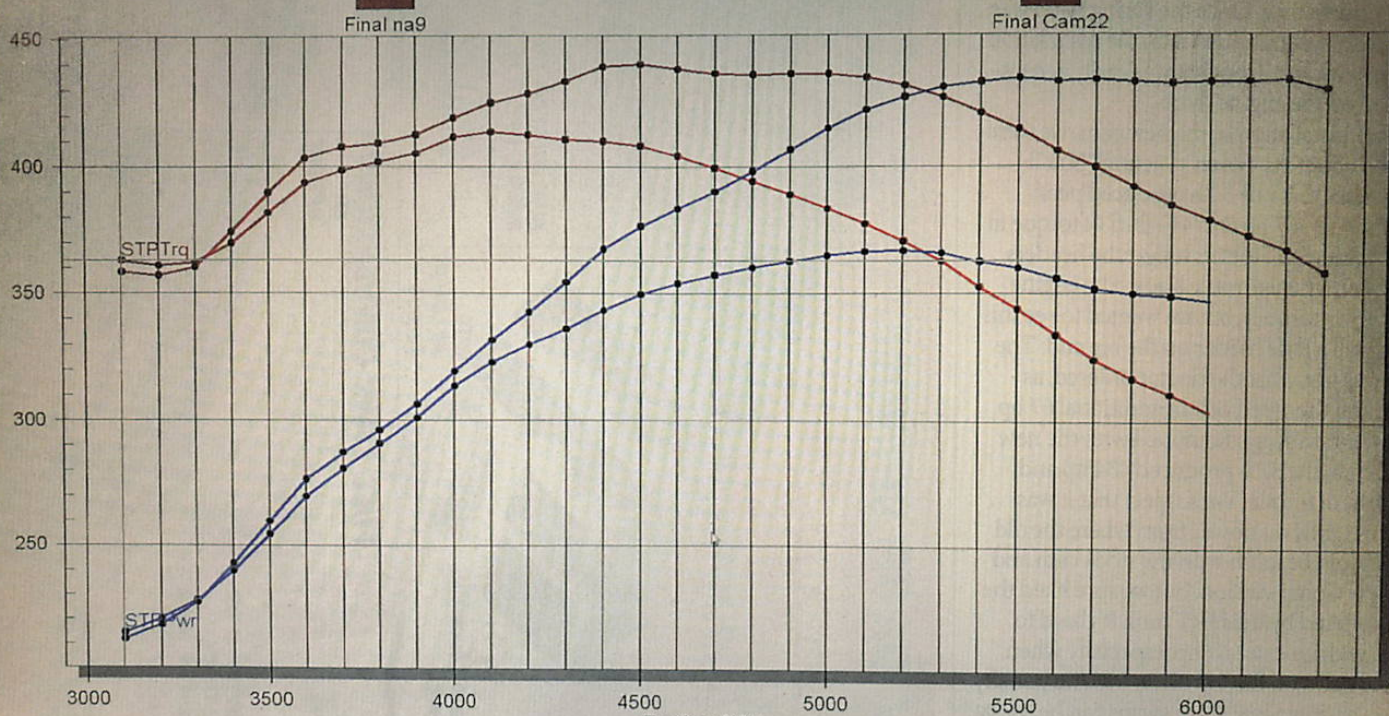


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13:44:31

5.7L HEMI DYNO TEST STOCK VS COMP CAM

Much like GM's LS platform, the Hemi was blessed with ample displacement, head flow, and a solid induction system. The only thing missing from the performance equation on a Hemi is cam timing. Run with the stock cam, the 5.7L Hemi produced 367 hp and 414 lb-ft of torque. After installation of the new HRT cam from Comp Cams, the power output jumped to 434 hp and 440 lb-ft of torque. The cam swap netted an impressive gain of 67 hp!

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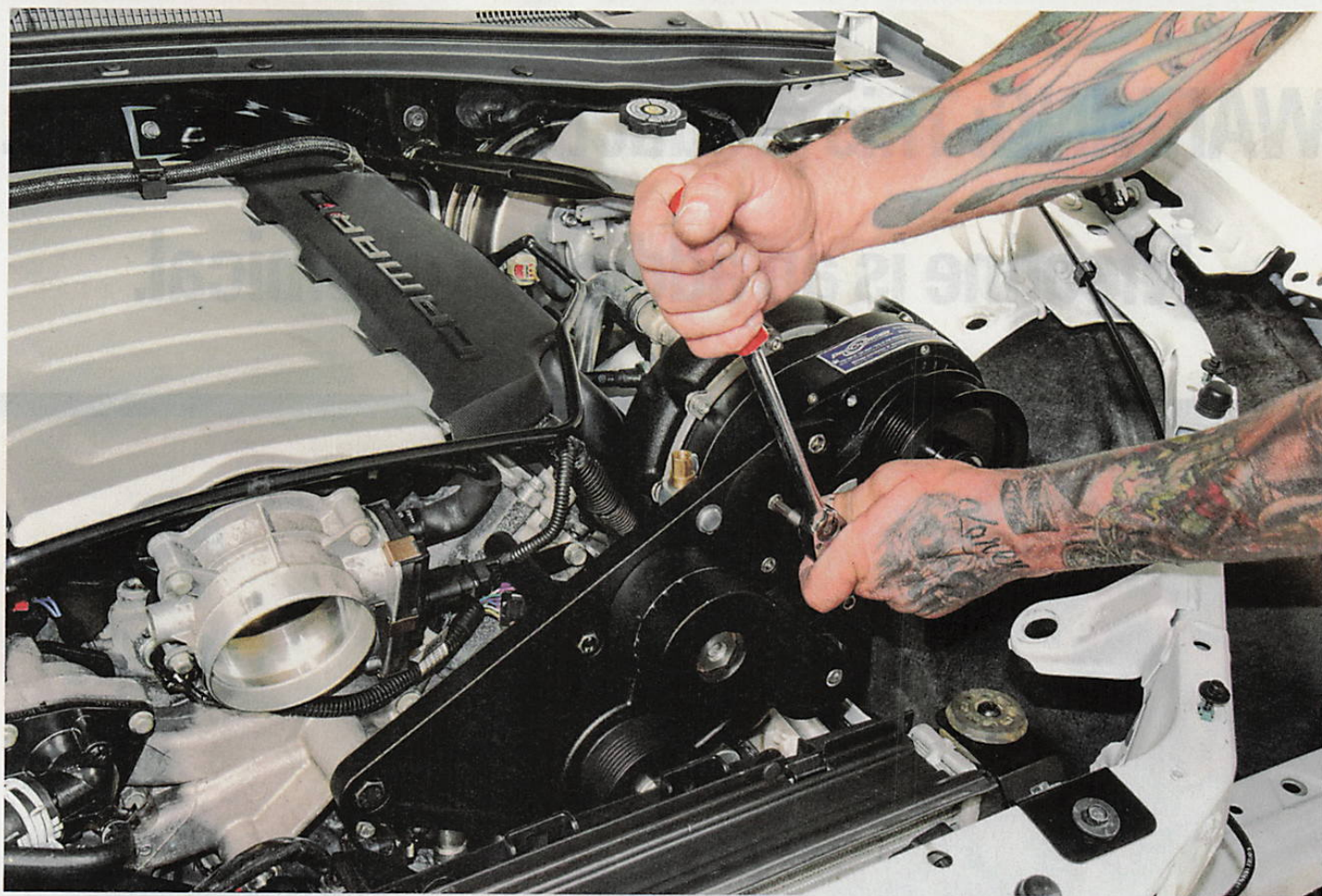
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Bolt-On Boost

A FEW POUNDS OF PROCHARGER-INDUCED AIRFLOW DELIVER 177 REAR-WHEEL HORSEPOWER FOR THE SIXTH-GEN CAMARO SS

Barry Kluczyk Chuck Vranas

Today's bolt-on systems deliver a bigger bang for the buck than ever before, and ProCharger's range of systems for the sixth-gen Camaro is a prime example.

On this otherwise stock 2019 Camaro SS, the car picked up an incredible 177 horsepower and 113 lb-ft of torque at the rear wheels, all with a modest 7 psi of intercooled boost. The max boost of 7 psi is significant because it's a must to stave off piston-burning detonation with the LT1's high 11.5:1 compression ratio.

A generation ago, a low-boost kit like this might have been good for about 100 horsepower, but advances in engine efficiency and supercharger technology have enabled the DIY bolt-on systems to offer tremendous



To establish a baseline, SMG Motoring, in Mendon, Massachusetts, ran the 2019 Camaro SS on their chassis dyno. It made 416.06 horsepower and 424.70 lb-ft of torque—a great starting point for this project.

gains. And, indeed, the ProCharger kit for the Camaro is something that can be installed at home by someone packing moderate wrench-turning skills.

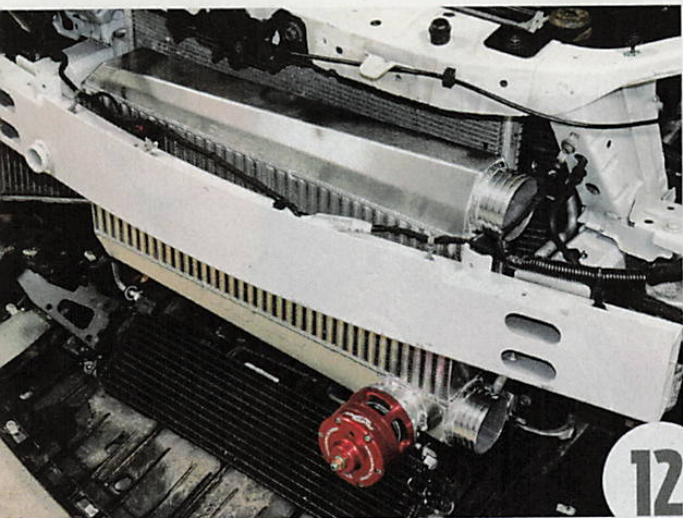
The oil pan doesn't need to be drilled and tapped for an oil feed line and none of the factory components have to be irrevocably modified. In fact, the factory

Sources

Competition Specialties 508.734.5127

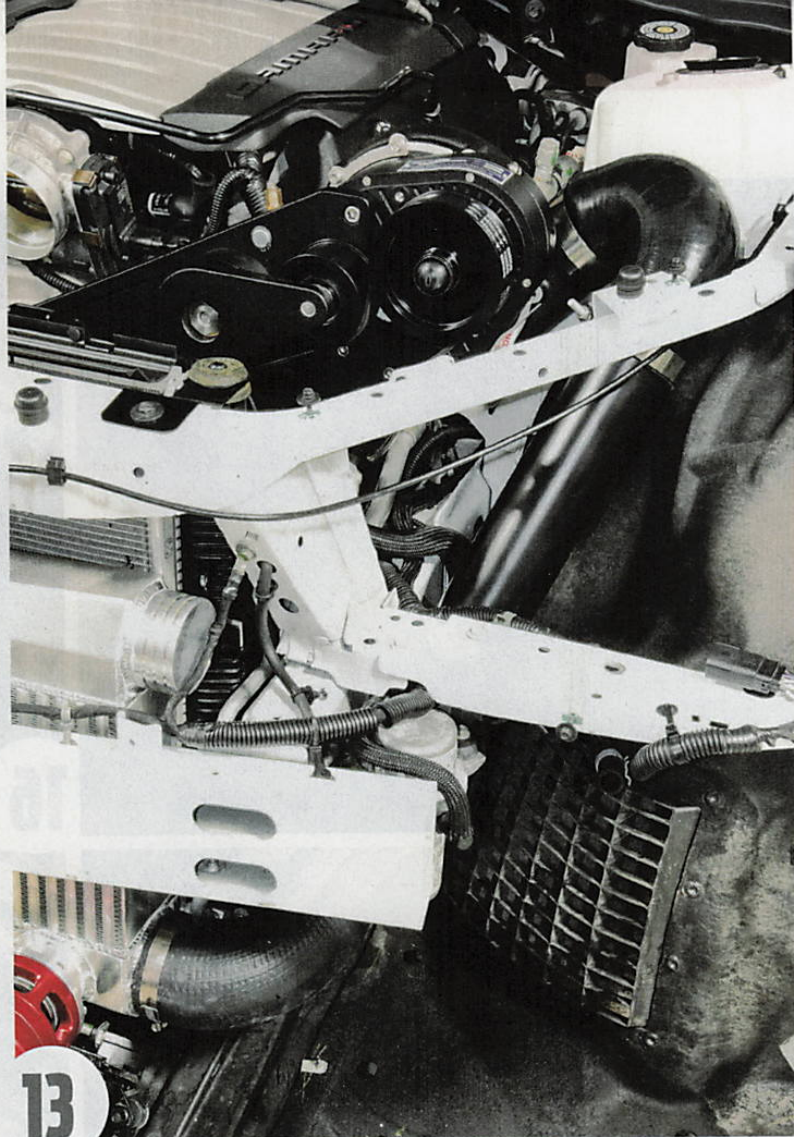
ProCharger 913.338.2886 procharger.com

SMG Motoring 508.244.4225
smgmotoring.com



12 This Stage II kit includes a high-capacity heat exchanger for the charge cooling system. It's an air-to-air system, meaning there's no coolant circulating through the heat exchanger, and therefore, no coolant pump and wiring. That saves time during the installation and reduces cost. After installation, the bumper beam bolts back in place.

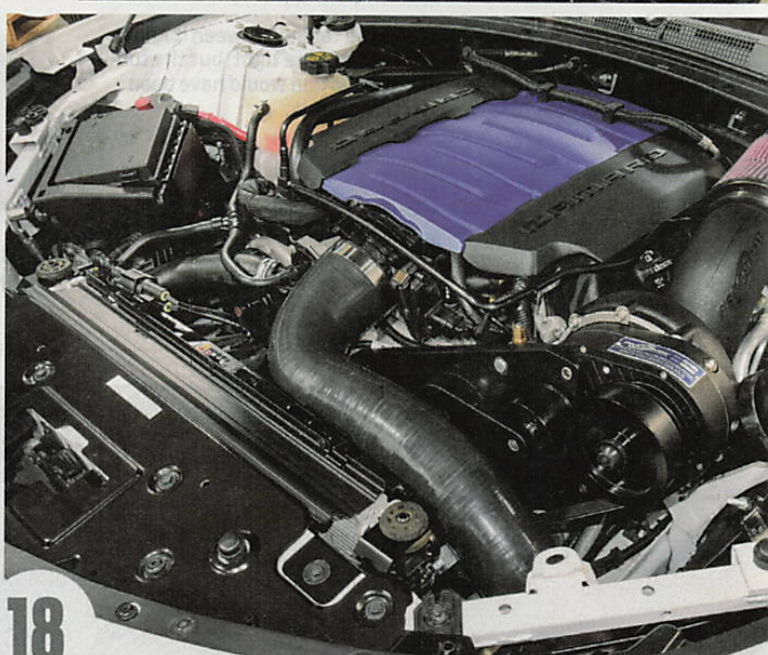
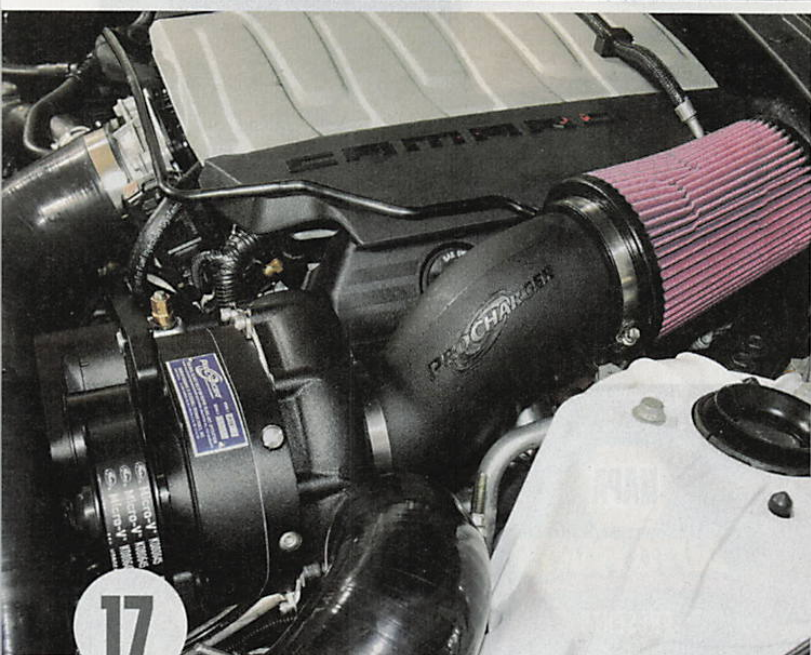
13 With the heat exchanger in place, the tubing between it and the supercharger is attached. The confines are tight, but the tubing slips in place relatively easily. Installation would have been impossible without removing the front fascia.



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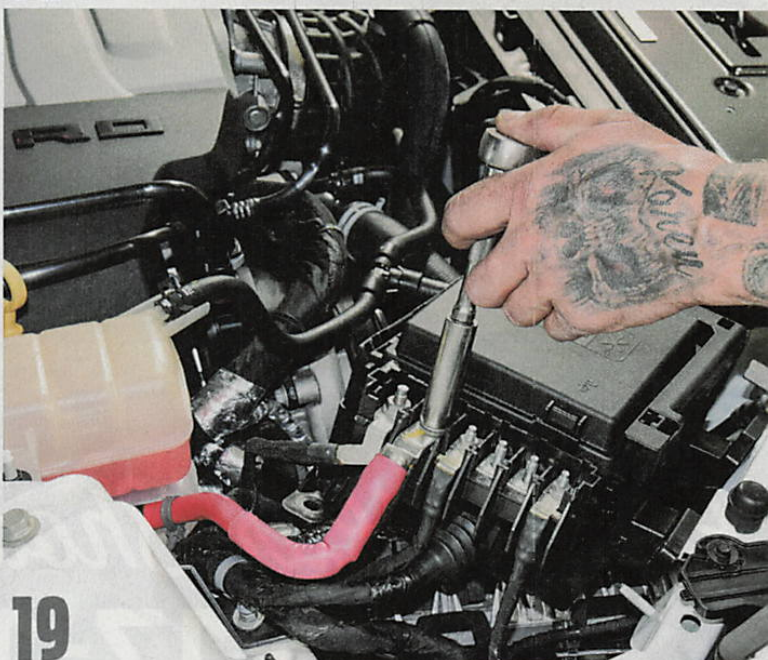
15 ProCharger's air intake tube connects the discharge port of the heat exchanger to the engine's throttle body. It includes a provision for the mass airflow sensor.

16 After that, the vacuum line for the race-style blow-off valve is installed. As with a turbo system, the blow-off valve is an escape for excess boost when the throttle closes. There's a breather on it that acts as a filter, too.

17 The final stages of the installation include fitting the air intake/filter assembly to the supercharger and reinstalling the front fascia. Note that there were no fuel system upgrades required. No spark plug change, either.

18 Experienced builders should be able to tackle the installation in about 10 hours, but planning for 12 hours (or more) is a little more realistic.

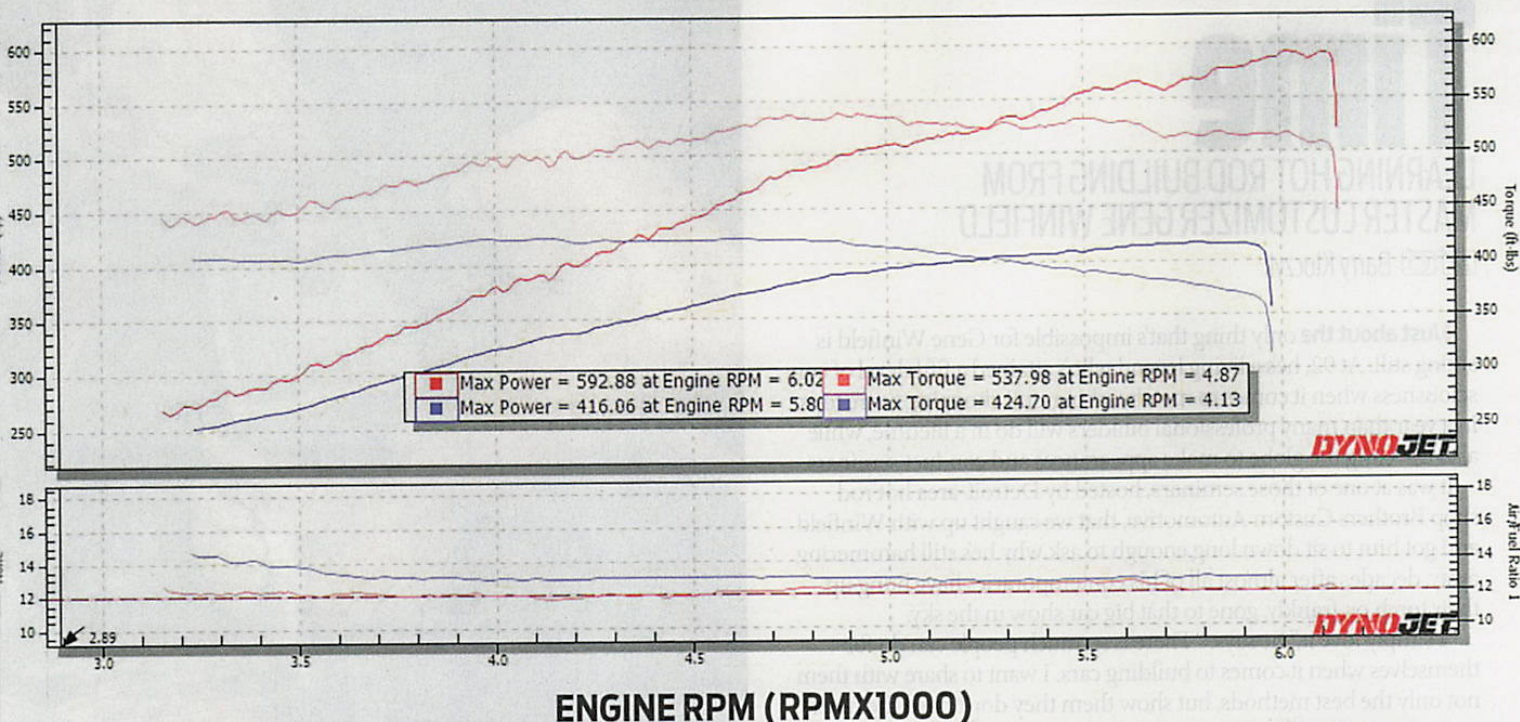
19 Finally, the re-flashed PCM is installed prior to firing the engine. The smart way is to send the controller off to be re-flashed while the kit is being installed.



DYNOJET

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Back on the chassis dyno, the Camaro SS project recorded 592.88 horsepower and 537.98 lb-ft of torque, eclipsing the baseline numbers by 176.82 horsepower and 113.28 lb-ft.

QUICK PERFORMANCE

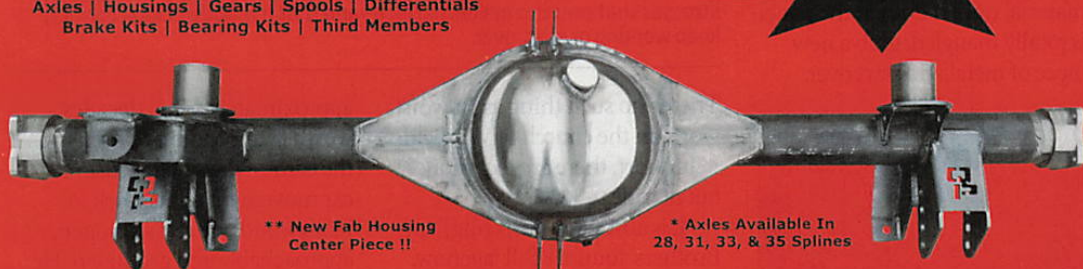
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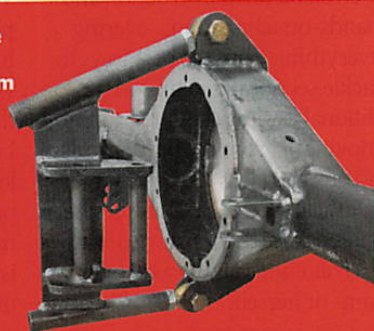
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Hammer Time

LEARNING HOT ROD BUILDING FROM MASTER CUSTOMIZER GENE WINFIELD

✍️ 📷 Barry Kluczyk

Just about the only thing that's impossible for Gene Winfield is sitting still. At 92, he's a living legend who's attained a fifth level of consciousness when it comes to metalworking, still chopping more tops in a year than many professional builders will do in a lifetime, while also traveling the globe to make appearances and conduct seminars.

It was at one of those seminars, hosted by Detroit-area hot rod shop Brothers Custom Automotive, that we caught up with Winfield and got him to sit down long enough to ask why he's still hammering away, decades after almost all of his contemporaries have hung up their torch or, frankly, gone to that big car show in the sky.

"I simply love it," he says. "There is so much people can do for themselves when it comes to building cars. I want to share with them not only the best methods, but show them they don't need the most expensive tools to do it."

His two-day workshop in Detroit blended instruction and hands-on fabrication, covering everything from the best ways to tackle sectioning to tips on traditional leading (keep the torch moving!). From the participants, no question was too basic for Winfield, and the techniques he shared were demonstrated with each attendee taking a turn for him- or herself.

Perhaps more importantly, Winfield imparted a work-it-out philosophy that is more than his practical strategy for metalworking, it's his orthodoxy. It's a doctrine rooted in certain basic beliefs: If the panel's not straight, keep working it until it is. If the panel doesn't fit, cut it or add material until it does. If the panel is totally mangled, grab a new piece of metal and start over.



■ Gene demonstrates joining two panels and grinding the seam smooth to eliminate virtually any trace of the weld. It's one of the areas where he stresses that practice makes perfect—and that if it doesn't look correct, keep working or start over.



■ Approximately 30 participants attended the two-day session, each bringing a different level of experience, but all eager for the personal instruction from a pioneer and true master of the craft.

There's no such thing as "It won't work" in the church of Winfield.

In short, there are techniques, but no rules.

"It is absolutely inspiring," says Brothers' founder Bill Jagenow. "I've known him for about 30 years, and what has always impressed me is that he will always find a way. That's such a strong message for anyone starting out with metalworking. Gene is never intimidated, because nothing to him is a failure. If it doesn't work, he just goes a different way. That's the way you have to approach work like this."

Even for those who don't plan to chop a top or french a tail-light anytime soon, Winfield's seminar is worth the time for the

approximately seven decades worth of anecdotes, covering the earliest days of the custom-car movement to his work for Hollywood. He remains open, approachable and grounded. He is the consummate enthusiast. In the days ahead of the seminar, he cruised Woodward Avenue, and after wrapping up two days of nonstop instruction, his instinct was to jump into Jagenow's '27 T roadster and lay rubber.

"I don't want to do anything else," he said, before packing up his wares and heading for the airport and on to his next appearance. His scheduled seminars are listed at Winfield's Custom Shop (www.winfieldscustomshop.com). Trust us, attending one is worth your time. **HM**



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01 The finer points of leading are demonstrated for Brothers' shop manager Autumn Riggle. Heat application with a long flame is everything; it helps keep the lead spreadable, like warm butter, but not hot enough to turn it to liquid.

02 Gene is a big proponent of gas welding, which he demonstrated, because it leaves the metal more malleable and therefore more flexible for shaping afterward.

03 Bill Jagenow assisted Gene with some of the instruction and demonstrations. Bill has been building hot rods himself for more than 25 years.

04 Gene wasn't the only piece of hot rod history in the shop. Brothers paused its work on the original Ingels-Kraft Roadster to host the seminar. The early hot rod is powered by a V8-60 flathead and graced the cover of the October 1954 issue of HOT ROD.



05



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05 At Brothers Custom Automotive in suburban Detroit, Gene Winfield collaborated with shop owner Bill Jagenow to host a two-day metalworking seminar. They have known one another for about 30 years. That's Bill's flathead-powered 1927 T roadster.

06 On the English wheel, more lessons on shaping metal. Gene also demonstrated shaping with decidedly less-expensive tools, including one made by welding a handle to an oxygen tank cap.

07 Along with the instruction came plenty of anecdotes from Gene's incomparable career, and plenty of laughs to go with them. The man has led an enviable life, all on his terms. We should all be so lucky.

08 Another part of the class demonstrated using a hammer and a spoon to shape metal without leaving scratches and other marks on the metal.



08

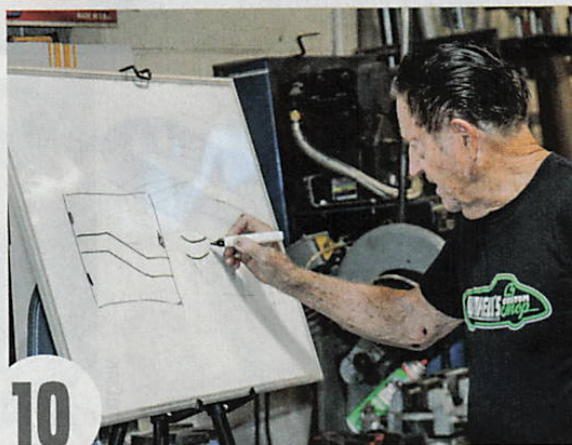


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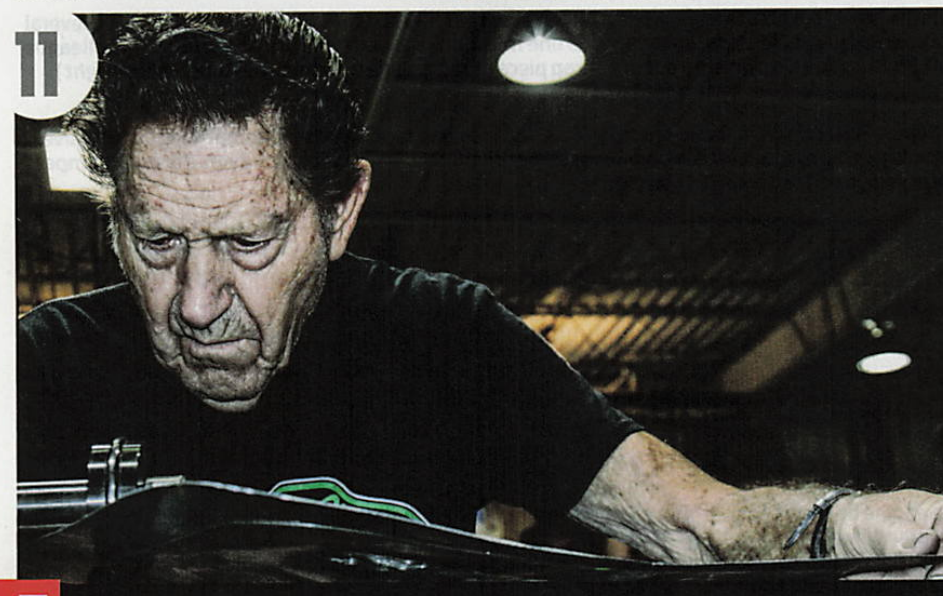
09 Gene travels with plenty of books, instructional videos, photos, t-shirts and more, and he'll autograph them all. It's difficult not to buy an item or two from the legend himself.

10 The seminar covered a variety of topics, including sectioning, where Gene illustrated cutting 4 inches out of a door, while leaving the door latch intact. He's been doing it for more than 75 years.

11 At 92, Gene is still chopping tops and traveling the globe making appearances and conducting seminars.



10



11

5 Things You Didn't Know About Gene Winfield

1. His first car was a 1929 Model A, which he purchased when he was 15 years old.

Medicine Hat, Alberta, is named in honor of him.

2. His nickname is Windy—and Windy's Diner located in

3. His aluminum-bodied Reactor show car appeared in *Bewitched*, *Star Trek*,

Mission: Impossible, and *Batman*. In the latter, it was dressed as the Catmobile for Catwoman.

4. He designed model cars for AMT

and eventually built full-scale show cars for the company.

5. His company produced 25 vehicles for the 1982 sci-fi classic *Blade Runner*.

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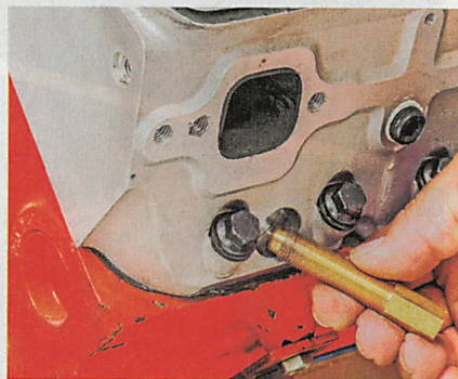
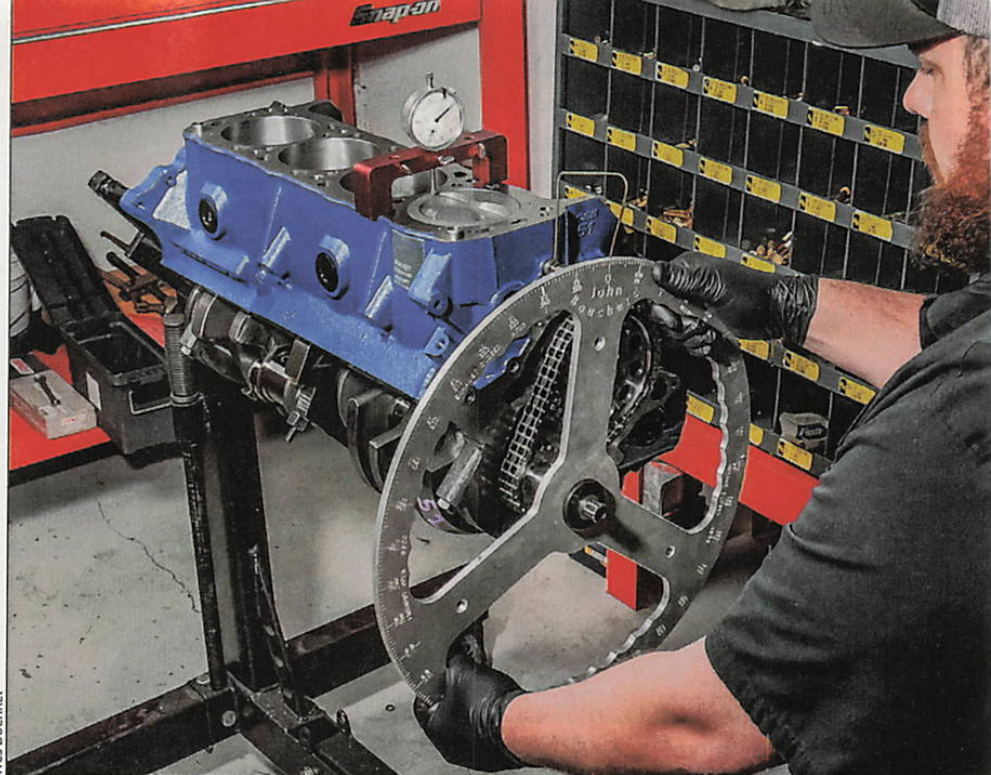
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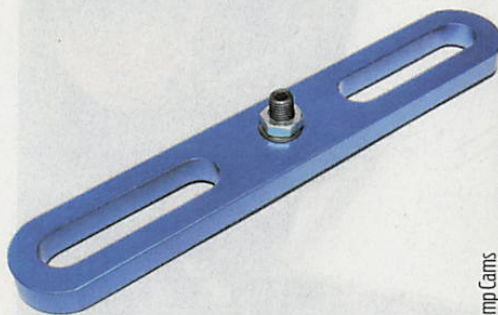
How Do You Accurately Find True TDC?

It's easy to find true top dead center (TDC) on a fully assembled engine using a degree wheel that bolts to the harmonic damper and a TDC stop that screws into the spark plug hole. Likewise, if you haven't yet bolted the heads to the short-block, use a piston stop that bolts to the engine deck. We show you how. **Marlan Davis**

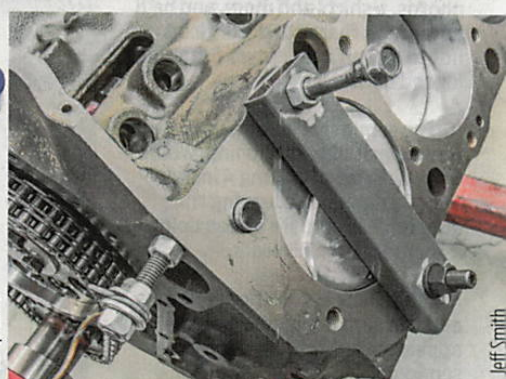
Wes Duenkel



Stops that screw into the spark plug hole are available to help find TDC with the cylinder heads installed. Screw the stop into the No. 1 spark plug hole. Install the degree wheel on the front of the crank hub or harmonic damper, aligning the wheel's zero mark with the zero mark on the timing tab or balancer.



Comp Cams



Jeff Smith

If the heads are off the engine, use a piston stop that bolts to the block's deck to find TDC. Several sources sell premade stops, including this one from Comp Cams (PN 4933, above left). My colleague Jeff Smith made his own stop out of a scrap piece of rectangular mild steel channel (above right).

Below: MSD offers this handy harmonic balancer degree tape kit with different-length, adhesive-backed degree marks for most popular balancer diameters. Perfect for non-degree'd stock dampers after you've verified true TDC location.



After installing the stop and degree wheel, rotate the engine by hand (not with the starter!) until it contacts the stop. Mark the degree wheel in line with the timing pointer. Rotate the engine in the opposite direction until the piston again hits the stop and mark the wheel. Split the difference and add a third mark. Remove the stop. Rotate the engine until the third mark and timing tab align. This is true TDC. If the preexisting balancer and timing tab zero marks don't align, correct the tab or balancer zero mark as needed.

MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	8.00" DIA
MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	7.50" DIA
MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	7.25" DIA
MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	7.00" DIA
MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	6.75" DIA
MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	6.375" DIA
MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	6.00" DIA
MSD	10	0	10	20	30	40	50	60	PN 8985
MSD	10	0	10	20	30	40	50	60	5.25" DIA

MSD

TOP DEAD CENTER STOPS

Comp Cams and its sister company Powerhouse Products are just two of several aftermarket outfits that offer premade piston stops.

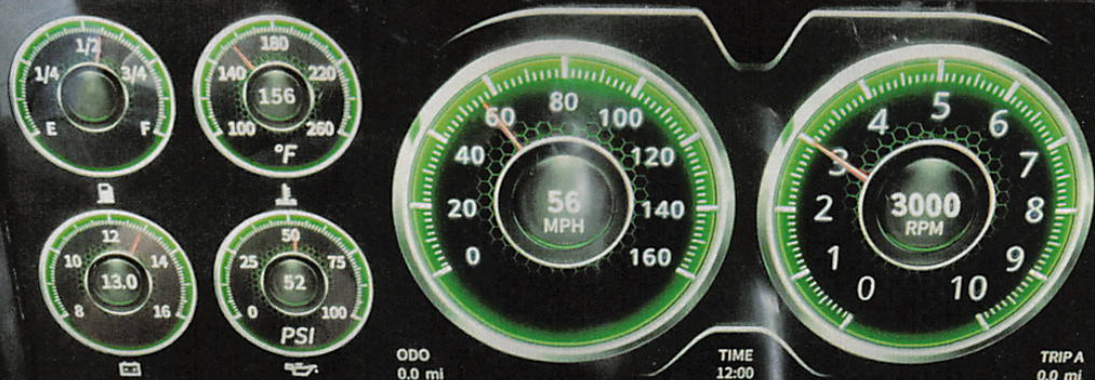
DESCRIPTION	COMP PN	POWERHOUSE PN
Universal heads-off type	4933	POW101330
Heads-on, 14mm spark plug holes (most engines)	4795	POW101330
Heads-on, 18mm spark plug holes (big-block Fords)	4792	POW101332

Sources

Comp Cams; Memphis, TN; 800.999.0853 or 901.795.2400; CompCams.com

MSD LLC, A Holley Brand; El Paso, TX; 888.258.3835 (tech) or 915.857.5200 (general); Holley.com/brands/msd.com

Powerhouse Products; Memphis, TN; 800.872.7223 (tech), 800.365.9145 (general), or 901.260.8256 (local); PowerhouseProducts.com



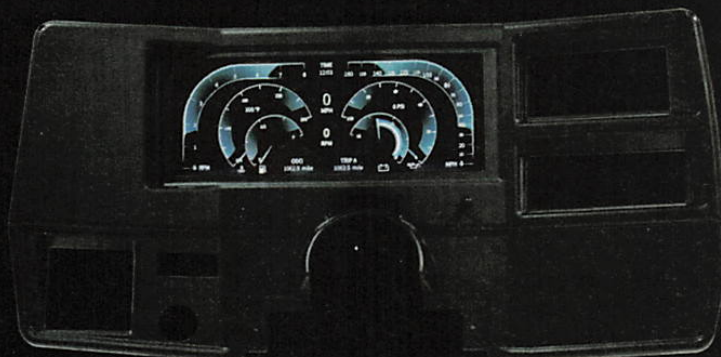
InVision Digital Dash

The new InVision Digital Dash is a six-gauge LCD system that allows you to monitor speedometer, tachometer, water temperature, oil pressure, fuel level, and volts all in one place on a bright 12.3" high-resolution display. Available in direct-fit solutions or as a standalone unit, you will be able to use this dash in a variety of applications. Featuring easy quick-glance readability along with the accuracy you have come to trust from AutoMeter, this system is the perfect solution for those looking to upgrade their worn, outdated, or inaccurate dashes with the latest offering from AutoMeter.

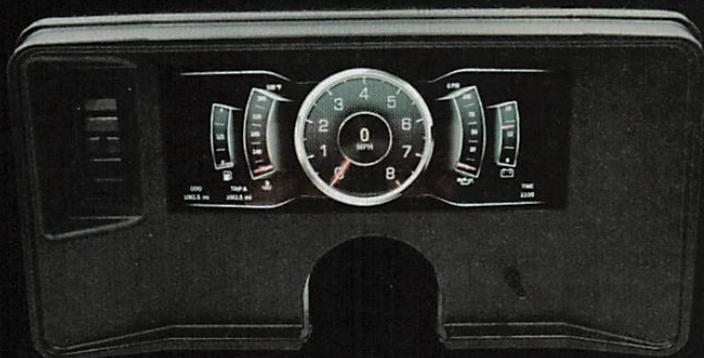
- 12.3" LCD display
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- High beam and turn signal indicators as well as user selectable warning light
- Displays in imperial or metric measurements
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Model 7004



Model 7005



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Gary Brehmer Asks...

What Large Wheel and Tire Options Fit a 1972 El Camino?

✉ Marlan Davis 📷 Hot Rod Archives

■ Old-school car; new-tech suspension, tires, and wheels: Powered by an old-school 454 big-block, Michael Erickson's 3,543-pound four-door 1967 Chevelle took fourth place overall in the 2017 *Super Chevy Muscle Car Challenge*. Giant tires and wheels plus a full Global West suspension provided the Geritol for what some might consider a dinosaur drowning in a swamp of LS-powered challengers.

Q:

I recently purchased a one-owner, stock 1972 El Camino. I plan to make small appearance changes while leaving the car pretty much stock. It shows that it has been very well cared for and is now my daily driver—around 3,000 miles a year. (Yes, I'm retired!)

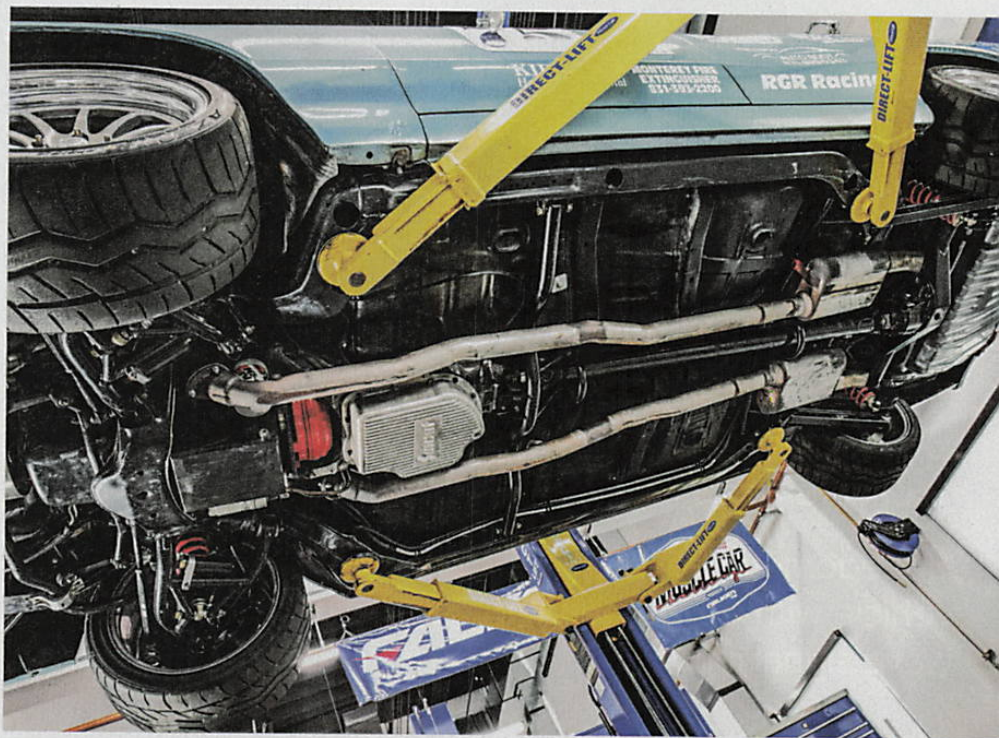
It currently has 14x6 Rally wheels with 205/70-14 whitewalls. I would like to change to 15- or 16-inch wheels with larger, wider Goodrich T/As. Based on availability of 16-inch wheel choices, I'll probably use 15x8-inch wheels. What would my wheel options be, offset required, and corresponding tire sizes that would fit without any modifications?

A:

It might be a surprise for some, but when it comes to maximum wheel and tire sizes for the popular 1964–1972 Chevrolet Chevelles and El Caminos, it is indeed possible to install huge, modern wheels and tires, although in extreme cases additional suspension modifications and wheelwell massaging could be needed. That's the consensus, according to leading aftermarket suspension experts and real-world tinkerers, including Global West, Hotchkis, Ken Crocie and his son Kevin (Machinehead Powersports), and my colleague Jeff "Mr. Chevelle" Smith, who's owned a posse of these cars, including one 1965 model he uses for autocross and road racing.

In many cases, huge 40- or even 35-aspect tires and 17-inch or larger wheels fit better than more traditional 50- and 60-series tires installed on classic 14- and 15-inch wheels. As wheel diameter increases, tire sidewall height and section width decrease. A modern big wheel/tire combo's overall outer envelope is not significantly taller than a more traditional wheel/tire package. The tall wheel also better clears the suspension and brakes, which allows more backspacing, permitting the use of wider-yet wheels and tires while still clearing the fenders.

■ The 1967 Chevelle's "square" tire and wheel combo: 315/30R18 Azenis RT615 rubber on 18x11 Jongbloed Racing forged aluminum wheels. This is an extreme example of a high-end tire/wheel package that fits with a heavily modded suspension that includes coilovers, but it's possible to achieve about 80 percent of this upsizing with less radical mods.



ASK MARLAN A TECH QUESTION: PITSTOP@HotRod.com

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As Global West's Doug Norrdin explains, "In the old days, we ran 16-inch wheels with 5-inch backspacing, and the tire would start running into the suspension. It was even worse with 14-inch and 15-inch tires. But as the wheel gets taller, the tire's sidewall bulge starts to get over the upper front control arm, which allows more backspacing, which allows wider wheels and tires. Seventeen- and eighteen-inch wheels are where you can really get going with the wide tires and wheels. If max handling is the goal, for decent tires you need to run an 18-inch or taller wheel. That's where most of the cutting-edge tire technology is centered around today."



■ For those who like traditional-appearing GM Rally wheels but still desire modern high-tech tires, check out Wheel Vintiques' Rallye wheel line. They're offered in many diameters and widths with numerous backspacing options, including special-order custom backspacing.

One wild card in fitting giant tires and wheels on GM A-bodies are model variations as well as production inconsistencies. For example, other GM division A-bodies might have less clearance than Chevys. Back in the day, production standards were sloppier than they are in our digital age and different plants might have used parts provided by different part suppliers. "I've seen variations in how the front fenders mounted," says a Hotchkis Suspension expert. "Some cars have a ton of shims; others have none. Using the same Hotchkis kit, we've seen body-to-frame clearance vary by 2 inches or more."

As I write this, the newest of these early A-body cars are nearly a half century old. Many have lived a rough life. The frames can have corrosion or collision damage and may be out of plumb. Things aren't always what they're supposed to be. "I've even seen the thickness vary on body panels, which can affect fender clearance," Norrdin points out.

Steering box internal stops may differ, affecting clearance at steering wheel right/left lock. More restrictive internal steering box stops provide better suspension clearance because tighter stops restrict the amount you can turn the steering wheel full left or right without hitting the stops. But that also means the turn radius becomes wider, which can be

a potential problem.

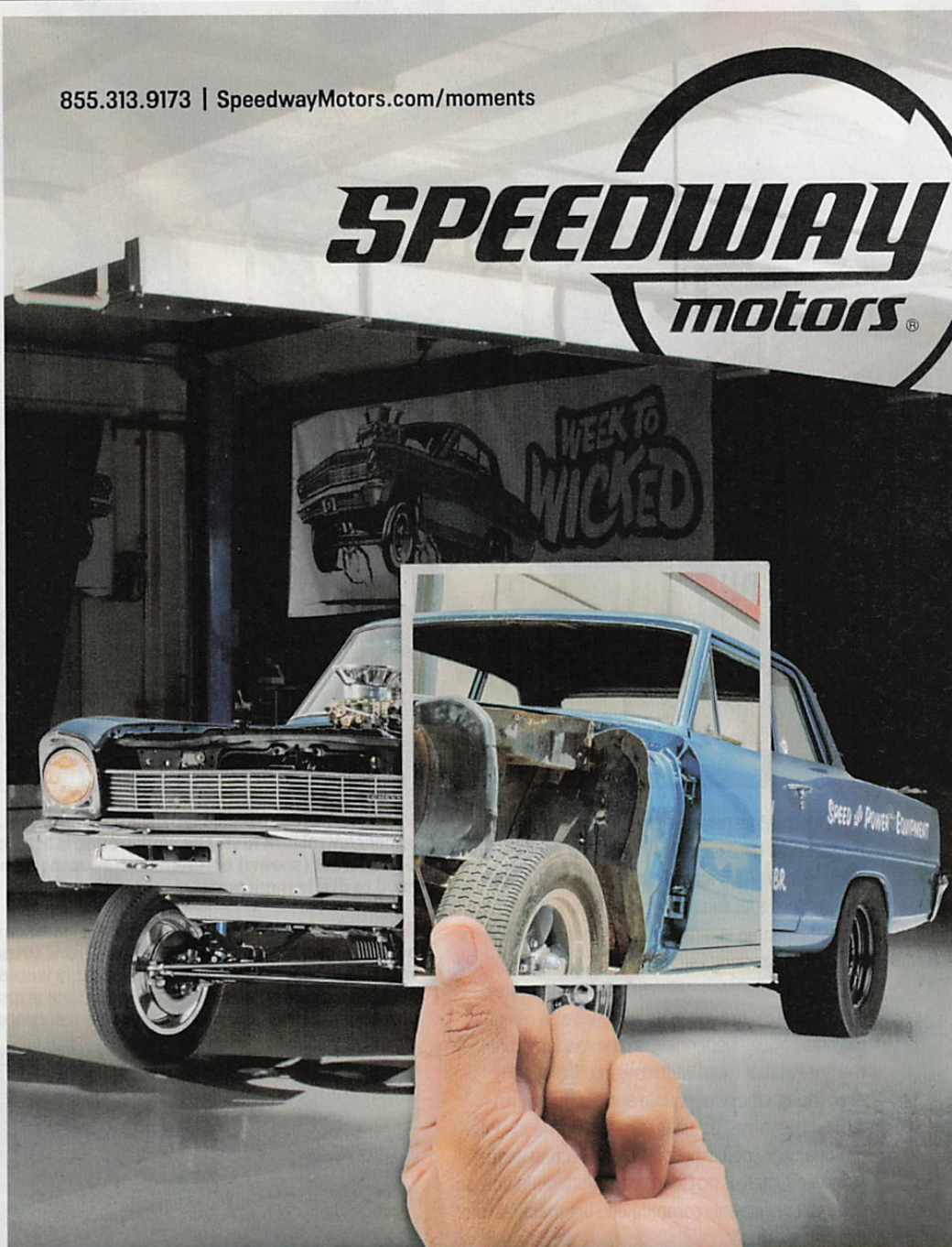
After all, designers of these cars never envisioned today's fat, large radial tires. As tires and wheels get wider, even the tightest steering boxes have difficulty returning to on-center neutral. "Most of these cars, with their narrow bias-ply tires and small wheels, came stock with 1/2- to 3/4-degrees positive caster," explains Lee Power Steering's Allan Padelford. "With big, wider, fatter radials, you must run more caster or they won't return to center without supplying more force. If the car has a rake—is nose down and higher in back—the problem is

worse because the spindle leans back."

How much more caster is needed? Machine-head's Kevin Crocie recommends 2 to 3 degrees positive caster, along with 1/16-inch toe-in and 1/2-degree negative camber, primarily for front suspension clearance. Padelford wants to see more: "5 to 6 degrees negative camber, but that usually calls for a tubular upper front control arm." Global West and Hotchkis offer the tubular arms. Besides developing additional caster, the tubular arms' geometry generates more negative camber without running into bumpsteer or running out of wheel-alignment

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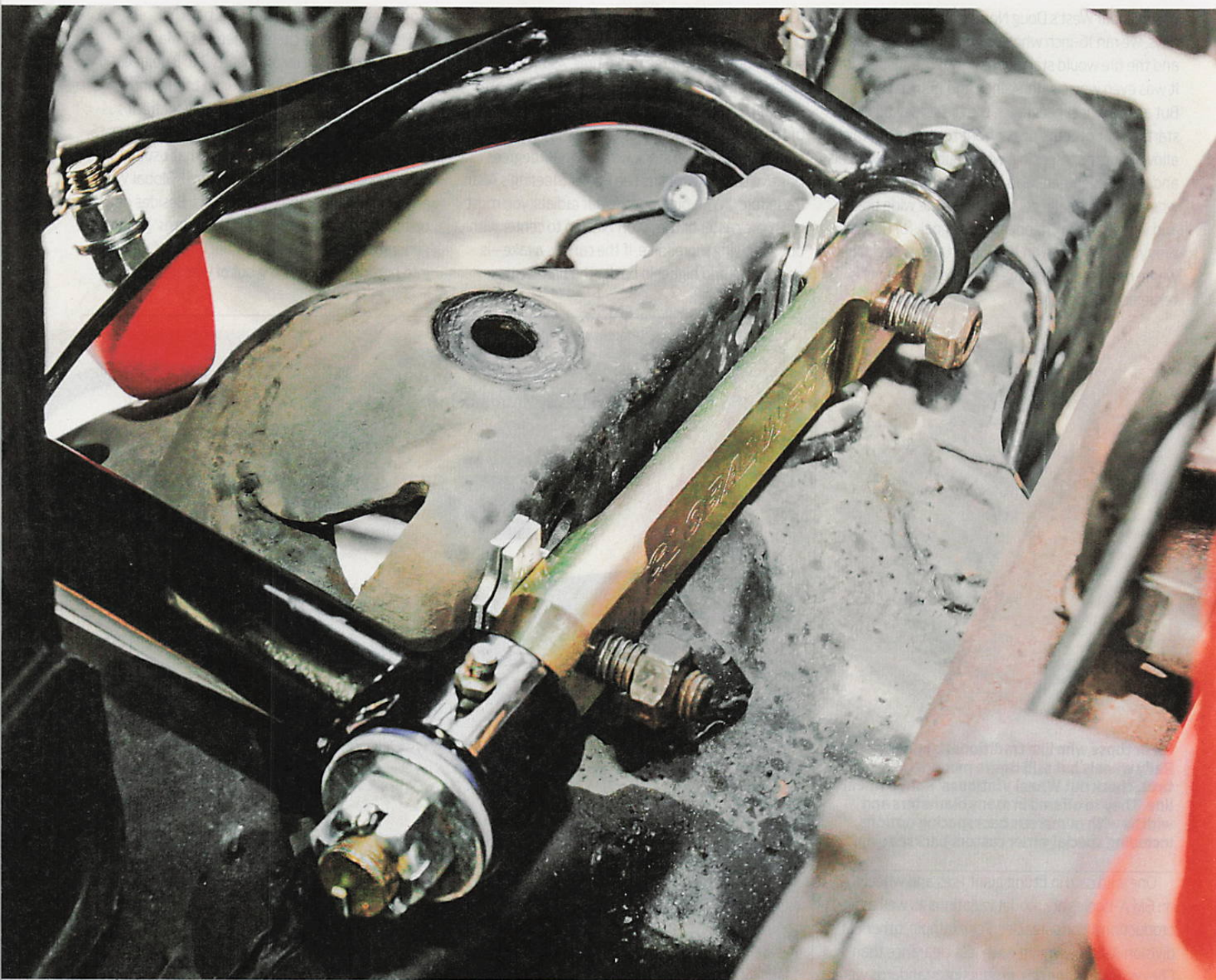
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shim room. More negative camber keeps the tires flatter under hard cornering conditions. Global also offers its own 7075 forged aircraft aluminum steering knuckles that further improve geometry. A more budget-oriented steering knuckle approach would be hitting the wrecking yard for a set of 1976 to 1996 GM B-body (fullsize passenger car) steering knuckles.

The specific tire you're running will also affect max clearance. "Depending on the manufacturer, the tire's actual tread width might differ slightly even though the aspect ratio and section width remain the same," adds Jeff Smith. "Unlike the internationally defined aspect ratio and section width standards, there is no clear tread width definition, so you can't necessarily compare one tire manufacturer against another."

Then there's aftermarket disc brakes and larger rotors. The car stops better, but for high-end brake packages you need correspondingly taller wheels to clear the larger-diameter rotors and big calipers.

Whew! Bearing all the above in mind, where do

■ **Up front with an increased backspacing wheel, a fat tire's sidewall bulge usually hits the stock upper control arm first. The workaround is aftermarket tubular upper control arms available from Global West (shown) or Hotchkis. New arms also help improve the suspension geometry. You'll still need to dial in more positive caster, though.**

■ **After the front upper arms, the next clearance worry is the outer tie-rod end followed by the antisway bar. This photo of Erickson's front suspension shows how close they come to the car's 18x11 wheel. A smaller diameter wheel probably wouldn't clear them. Note the Global West KT-624 suspension including coilovers, tubular control arms, and 7075 forged aluminum steering knuckle—the ultimate manifestation of its negative-roll concept.**

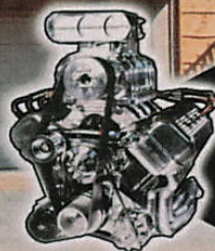


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you run out of wheel/tire clearance first? Up front, the initial contact point is usually the upper control arm, followed by the outer tie-rod end, and then the antisway bar.

Back at the rear, wide tire sidewalls tend to hit the outer fender lip first. That's been a known problem for years even with old-school wide wheels and tires. If that happens—not all that uncommon—it's time for a little hammer work, flattening or rolling back the inside lip. Increase rear backspacing enough, and eventually you'll contact the inner fender. Hardcore guys will trim the inner fender back as needed for clearance. You could also add wheeltubs and ultimately a shorter diameter rearend.

Early A-bodies have different amounts of clearance. Jeff Smith says 1964 to 1965 was the tightest, 1966 to 1967 have a little more clearance, and 1968 through 1972 have the most clearance. If a given wheel/tire package fits a 1964–1965 car, it will undoubtedly fit later years, but later may not always fit earlier. Just about everyone we talked to drew no distinction between Chevelles and the pickup truck-like El Camino, even though their rear external body contours are different. The one exception was Hotchkis, which maintains the El Camino has a little less fender room. "At the

■ Erickson's rear wheel/tire clearance benefits from mini-tubs, but the stock GM perimeter frame remains as is. As you go progressively wider on a stocker, the tires first hit the outer fender's inside lip (roll it back) followed by inner fender contact (trim the inner sheet metal away as necessary for clearance). Also, note how close the tire/wheel gets to the lower control arm.

■ Stock GM A-body rear lower control arms flex under cornering loads, even the upgraded boxed version used on SS and other high-performance models. With big meats, contact might occur even though there seems to be sufficient static clearance at rest. To eliminate this lateral movement while preventing bind as the bar travels through its arc, Global West's stout lower arm has a Del-a-Lum bushing on the rearend side (right) and a spherical bearing on the frame side (left).





■ Designed for home users, Percy's WheelRite wheel and tire size simulator can help determine optimum wheel and tire size envelopes. It works with wheel diameters between 15 and 30 inches for four- and five-lug applications, supports 6 to 11 wheel-width measurements, and identifies the proper backspacing allowing an enthusiast to confidently order custom wheels.

extreme wheel and tire sizes, you may have to go to the next-narrower tire size than recommended with a Chevelle." If your head's not spinning already, through all the years and all his different Chevelles and El Caminos, Smith says the left- and right-rear clearances are slightly different. "It seems the bodies shift about $\frac{1}{8}$ to $\frac{1}{4}$ inch to the right. In other words, there's more clearance on the left-hand inner fender and less clearance on the right-hand inner fender." Whether this is from years of applied torque forces or the cars just came out of the factory that way is anyone's guess.

By this point, we've clearly departed from a simple old-school 15-inch wheel solution. Without a doubt, everyone agrees you can run 225/60-15 tires front and back on 15x8-inch wheels with stock, 4.5-, or 4.75-inch backspacing. Norrdin says a 225/45-16 on a 16x8-inch wheel with 4.5-inch backspacing usually clears as well. On the other hand, as the table on page 74 shows, gigantic wheel and tire packages are possible with the listed suspension and body mods.

Remember: At the extremes, measure, measure, and measure again!

Sources

GLOBAL WEST SUSPENSION COMPONENTS INC.; San Bernardino, CA; 877.470.2975 or 909.890.0759; Globalwest.net

HOTCHKIS SPORT SUSPENSION; Santa Fe Springs, CA; 877.466.7655 or 562.907.7757; Hotchkis.net

LEE POWER STEERING; Santa Clarita, CA; 661.568.9170; LeePowerSteering.com

MACHINEHEAD POWERSPORTS; Dripping Springs, TX; 909.240.9330; MachineheadRPM.com

PERCY'S WHEELRITE (TAYLOR CABLE PRODUCTS INC.); Grandview, MO; 816.765.5011 (general) or 800.841.3600 (nearest dealer); TaylorVertex.com/wheelrite/

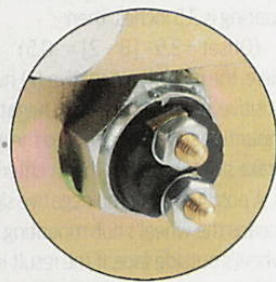
WELD RACING; Kansas City, MO; 800.788.9353; WeldWheels.com

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Backspacing vs. Offset

Often, we hear the terms backspacing and offset used interchangeably as applied to road-wheel dimensions. They are not the same, but you can derive one from the other. In the real world, I've found backspacing is the more practical dimension when considering fitment characteristics: It's easier to measure if a tire is already mounted on the wheel, and less confusing then offset. Here's how the industry defines these two terms:

BACKSPACE: The distance from the brake hub or wheel-mounting surface to the wheel's inboard edge. Measure backspace by placing the wheel facedown on the ground with its backside facing up. Lay a straightedge across the wheel's inboard flange. Measure the distance from where the straightedge contacts the inboard flange to the wheel hub's mounting pad.

OFFSET: The distance from the wheel hub mounting surface to the wheel centerline. If your wheel manufacturer lists offset instead of backspacing, you can convert your backspace measurement by using the following formula:

$$(\text{Offset} = \text{Backspace} - [\text{Rim Width} \div 2])$$

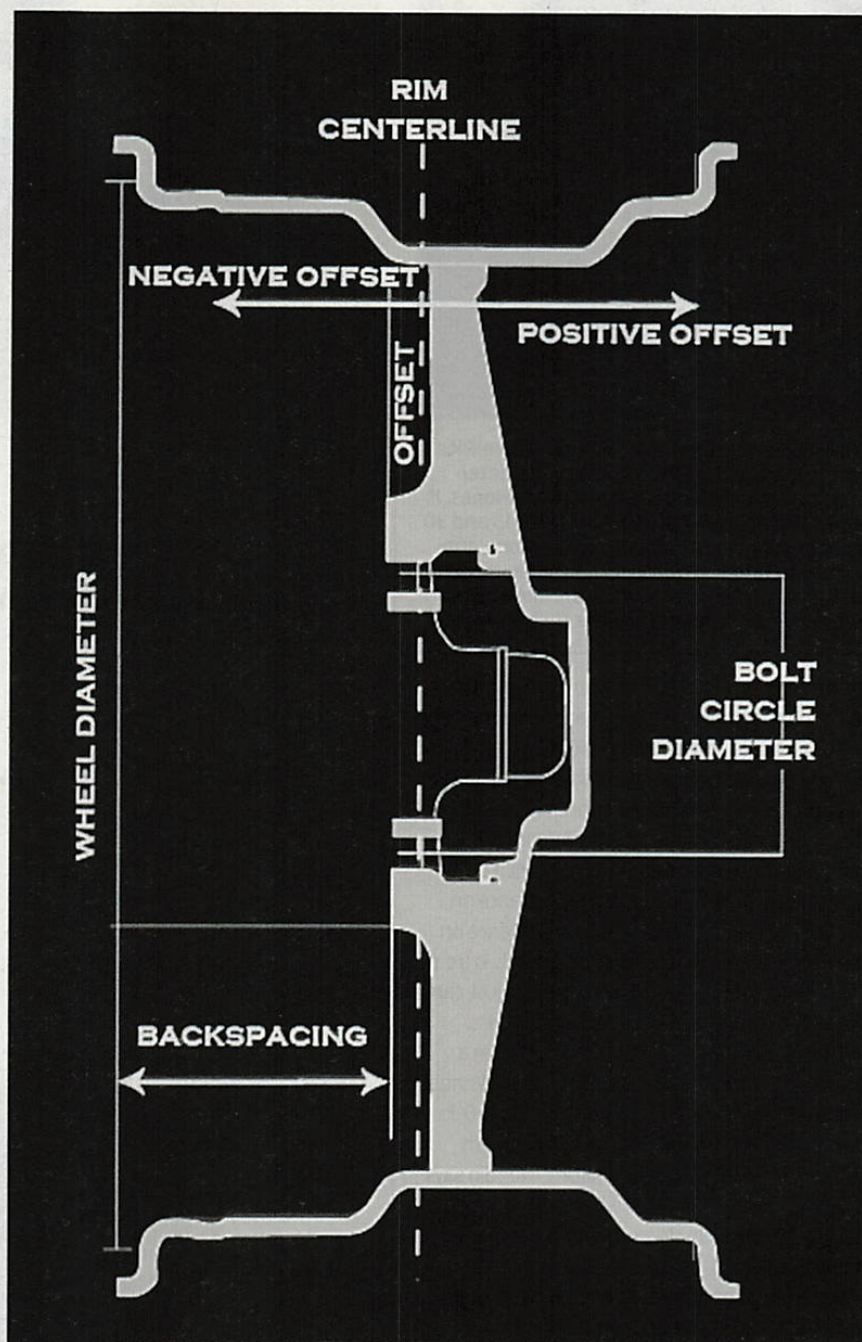
Start by measuring the overall width of the wheel from flange-to-flange (outside-to-outside). This measurement ends up somewhat larger than the officially stated industry width measuring standard that's based on the wheel's tire bead seat, but that doesn't apply here. Let's say a 15x7 wheel measures 8 inches flange-to-flange, and the measured backspacing is 3.5 inches; then:

$$(\text{Offset} = 3.5 - [8 \div 2] = -0.5)$$

Here, the result is a negative (-) number. Wheel offset can be positive, negative, or zero. A negative offset means the hub mounting surface is closer to the wheel's inside edge (the brake side) than the wheel centerline-to-inner edge distance is. A positive result (no negative sign in front of the number) means the wheel's hub mounting surface is closer to the wheel's outside face. If the result is zero (0), the mounting surface is even with the wheel centerline. And if you need to go the other way and find backspacing if offset is known, then the formula is:

$$(\text{Backspace} = \text{Offset} + [\text{Rim width} \div 2])$$

Remember, if known offset is negative, put a minus sign (-) before the offset value.



1964-1972 CHEVROLET CHEVELLE/EL CAMINO TIRE & WHEEL RECOMMENDATIONS

All dimensions are in linear inches. Combos that are listed for early models should fit later models, but later will not necessarily fit earlier. Suspension must be in good shape with fresh bushings and ball joints, plus the frame must not be tweaked from collision, age, or corrosion. These recommendations do not necessarily apply to similar-vintage A-bodies from other GM divisions.

MODEL YEAR	FRONT				REAR				SOURCE
	WHEEL		TIRE	SUSPENSION MODS	WHEEL		TIRE	SUSPENSION MODS	
	SIZE	BACKSPACING			SIZE	BACKSPACING			
1964-1965	17 x 9.5	6.0	275/40-17	Global West tubular upper control arm	17 x 9.5	6.0	275/40-17	Trim inner fender lip, Global West upper control arm with spherical bearing	Jeff Smith
1966-1972	17 x 9.5	6.0	275/40-17		17 x 10.5	6.5	285/40-17 or 295/40-17		
1964-1972	16 x 7.5	4.5	225/45-16	Stock	16 x 8	4.5	225/45-16	Stock	Global West
1964-1972	225 section-width tire x 26in tire height ¹			Stock, slight lowering, no control-arm changes	245 section-width tire x 28in tire height ¹		Stock, slight lowering, no control arm changes	Hotchkis	
1964-1972	245 section-width tire x 26in tire height ¹			Tubular control arms, more negative camber	275 section-width tire x 28in tire height (Chevelle) ¹ 255 section-width tire x 28in tire height (El Camino) ¹		Tubular control arms, clearance fender lip	Hotchkis	
1964-1972	17 x 9.5	6.0	275/40-17	Global West KT 423 front suspension including its tubular upper arm and forged steering knuckle	17 x 9.5	6.0	275/40-17	Global West, spherical bearing upper arm, roll/flatten rear fender lip	Global West
1968-1972	18 x 9.5	6.0	275/35-18		18 x 11	6.0	315/35-18		
1968-1972	15 x 8	4.5	235/60-15	Stock	15 x 8	4.5	235/60-15	Stock	Gary Brehmer ²
1970-1972	17 x 8	4.75 or 5.0	245/45-17	Stock with additional caster	17 x 9 or 9.5	5 or 5.25	275/40-17	Roll/flatten rear fender lip as needed	Machinehead
1970-1972	15 x 8 Rally	Stock or 4.75	255/60-15	Stock	15 x 8 Rally	Stock or 5.0	255/60-15	Stock	Kevin Crocie

NOTES: ¹On appropriate wheel size to achieve specified tire height. ²What this car owner has used on similar Chevelles/El Caminos in the past.

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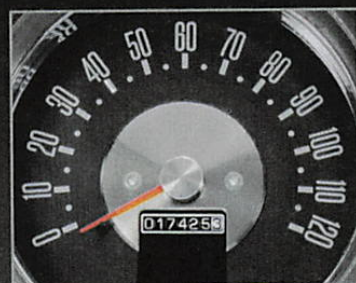
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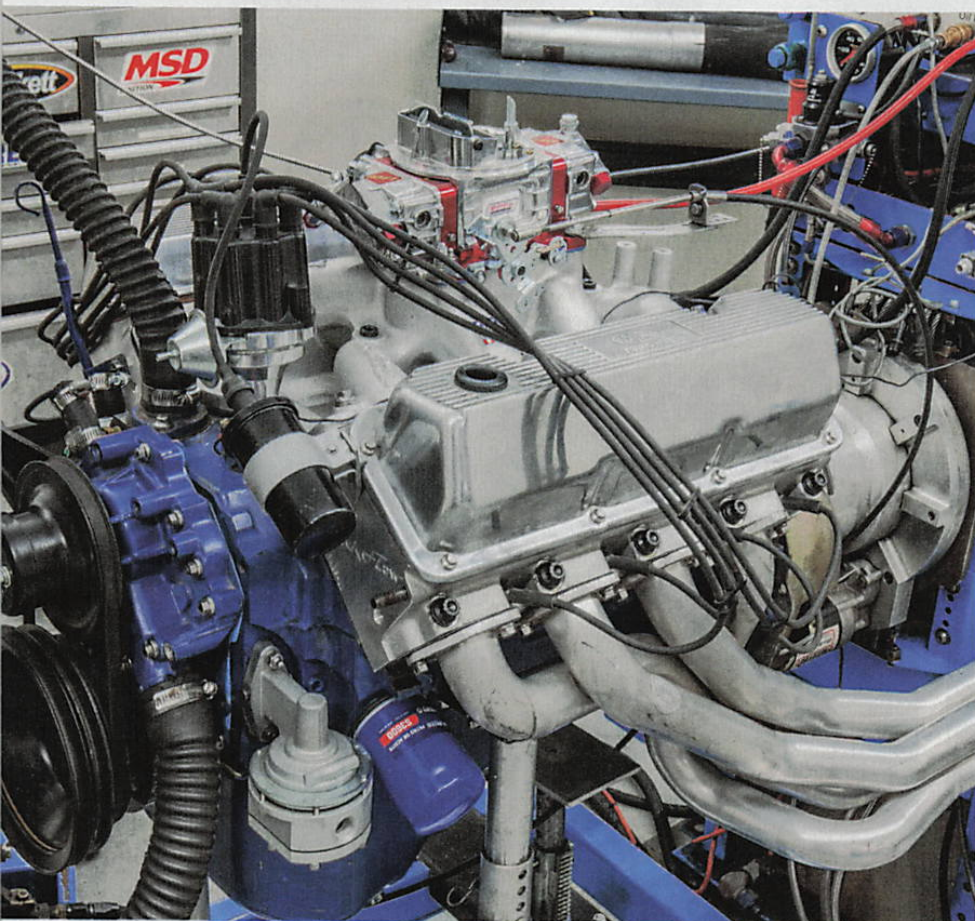
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Sources

76 (Phillips 66 Co.); Bartlesville, OK; 800.527.5476; 76.com

Advanced Engineering West (AEW); Mira Loma, CA; 626.222.4648; AEWperformance@aol.com

Automotive Racing Products (ARP); Ventura, CA; 800.826.3045 or 805.339.2200; ARP-Bolts.com

DynoMax Performance Exhaust (Tenneco Inc.); Monroe, MI; 800.325.8886; DynoMax.com

Edelbrock LLC; Torrance, CA; 800.416.8628 (tech) or 888.799.1135 (e-commerce sales and customer service); Edelbrock.com

Ford Powertrain Applications (FPA); Puyallup, WA; 253.848.9503; FordPowertrain.com

G & J Aircraft and Competition; Ontario, CA; 909.986.6534; Hella Inc.; Peachtree City, GA; 877.224.3552 or 770.631.7500; HellaUSA.com

Holley—Hooker—Quick Fuel; Bowling Green, KY; 866.464.6553; Holley.com

K&N Engineering Inc.; Riverside, CA; 800.858.3333 or 951.826.4000; KNfilters.com

Lucas Oil Products Inc.; Corona, CA; 800.342.2512 or 951.270.0154; LucasOil.com

Motorcraft Parts—Ford Parts; Dearborn, MI; 800.392.3673; Motorcraft.com or Parts.Ford.com

PerTronix LLC; San Dimas, 909.599.5955; PerTronix.com

Summit Racing Equipment; Akron, OH; 800.230.3030 (U.S.) or 330.630.3030 (outside U.S.); SummitRacing.com

SuperFlow Dynamometers & Flowbenches; Sussex, WI; 262.252.4301; SuperFlow.com

Trick Flow Specialties (TFS); Tallmadge, OH; 888.841.6556 or 330.630.1555; TrickFlow.com

Westech Performance Group; Mira Loma, CA; 951.685.4767; WestechPerformance.com

Real-World Repair: 1973 Mustang

PART 3: WE FIXED DON HICKS' 393CI CLEVELAND WITH A NEW CAM AND UPPER-END SWAP. NOW WE'RE GONNA TEST IT—ON BOTH AN ENGINE AND A CHASSIS DYNO

✍ Marlan Davis 📷 Marlan Davis, Don Hicks, Mark Sanchez

Smackdown: Engine Dyno vs. Chassis Dyno

What's the real-world difference between running an engine on an engine dyno, or, as installed in the car on a chassis dyno? Recently, we were able to conduct an engine dyno versus chassis dyno smackdown using the Ford 393 Cleveland stroker-engine from Don Hicks' 1973 Ford Mustang. Regular HOT ROD readers know that over the last few months we've been busy fixing the ailing 393 that initially arrived at Mark Sanchez's Advanced Engineering West (AEW) with a flat cam lobe. Initially Sanchez replaced the dead flat-tappet hydraulic cam with a Comp Cams Mutha' Thumpr hydraulic-roller cam and associated valvetrain components ("Real-World Repair, Part 1" Mar. '20). But that was only half the fix. A previous machinist had botched the adjustable valvetrain conversion on the engine's rare Ford Australian 302C-2V Cleveland heads to the extent they were beyond economical repair. In their place went a set of modern, free-flowing Trick Flow Specialties (TFS) 225 aluminum cylinder heads. To keep up with the new hot cam and heads, we swapped out Hicks' existing low-rise Edelbrock Performer intake and Brand-X small four-barrel economy carb for an Edelbrock high-rise Air-Gap dual-plane intake topped by Quick Fuel's SS-750 double-pumper carb ("Real-World Repair, Part 2" May '20).



■ How much power do you lose through the drivetrain? The experts claim about 15- to 17-percent drop in power at the wheels with a manual trans compared to flywheel numbers; as high as 27 percent with an automatic and loose converter. But many other factors come into play, as we discovered when we ran Don Hicks' newly rescued 393 Ford Cleveland stroker on both an engine dyno and—in his 1973 Mustang—a chassis dyno as well.

But the proof of the pudding is in the eating. We wanted to make sure Hicks' engine was really fixed, and of course the new combo would need some fine-tuning. With the engine already removed from the car for its original repairs, we could go for a twofer: Westech Performance has both a SuperFlow engine dynamometer as well as a SuperFlow chassis dyno. Let's test it on both and find out for sure.

For a single four-barrel carbureted engine Westech gets \$800 a day, which includes (as needed) initial break-in, valve-lash adjustment, carb tuning, setting the timing, and recurving the distributor. When the engine leaves, Westech's Steve Brulé says it's ready to go into your vehicle or boat. Fuel and other consumables are extra, or you can bring your own. The chassis-dyno is \$550 per half-day for single four-barrel applications; it includes engine tuning and optimizing the carburetor and ignition timing. Whether engine or chassis

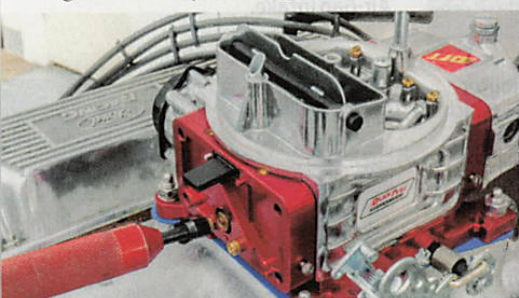
dyno, Westech charges more for multiple carbs, forced induction, poweradders, and/or EFI.

Engine Dyno: Accurate Measuring of Torque and Power

First up, we will run this combination on the engine dyno, which measures torque and power at the flywheel. You'll recall after installing the small-chamber TFS heads on the 393's existing 4.030-inch bore x 3.85-inch short-block, static compression came in at 10.08:1. Comp Cams' 291THR7 Mutha' Thumpr hydraulic-roller cam specs out at 0.567/0.552-inch valve lift and 224/249-degrees duration at 0.050-inch tappet lift. The TFS heads' intake ports flow 313 cfm at 0.700-inch lift, an important gauge of a normally aspirated engine's power potential.

Brulé installed the engine with Westech's standard set of Hooker Super Comp Cleveland dyno headers: 1½-inch primary tubes dumping into 3½-inch collectors and 18-inch collector extensions. After a problem-free 20-minute break-in, tuning began, with the engine responding best with 35-degrees total advance. Quick Fuel's SS-750 double-pumper needed only a simple jet change, from its factory-installed No. 74 primary/65 secondary jets to a 71/77 combo. All runs were on 91-octane 76 unleaded premium gas, corrected using the SAE J607 performance-industry standard factor (roughly equivalent to the old-school "gross horsepower" rating method, it generates numbers about 4 percent higher than SAE J1349 net hp, the current rating method used for late-model production cars).

Turns out, thanks to TFS, Comp Cams, Quick Fuel, Edelbrock, and Hicks' pre-existing stroker short-block, the final, fully tuned-in engine dyno run shows—at least in small-block terms—we had spawned a real torque monster: a peak 500.8 lb-ft at 4,600 rpm with an overall torque curve flatter than the Texas panhandle from 3,500 rpm (the beginning of the sweep) all the way through to 4,800 rpm. Torque never fell below 497 lb-ft throughout that range, and output was at least 400 lb-ft or better all the way up to the 6,200-rpm test-range high point. At power peak, the 393 churned out 512.3 hp at 5,800 rpm; it exceeded 450 hp from 4,800 rpm on up and made over 500 hp from 5,600-6,000 rpm. Average output throughout the 3,500-6,200 rpm test range was 481.4 lb-ft and 476.9. Average torque-peak to power-peak numbers, important for establishing best e.t. shift points in a car geared strictly for competition, came in at 482.5 lb-ft and 476.9 hp.



■ Despite provisions for all sorts of granular fine-tuning, Quick Fuel's SS-750, 750-cfm, double-pumper needed only slight jet changes to perform well: 71 primary/77 secondary on the engine dyno; 71/71 "square" in the car.

Those numbers are pretty good for a street-driven small-block, but Westech has an optimized, sealed dyno cell with blow-through fans (you can barely open the cell doors with them on), plus strictly controlled coolant and oil temps. Typically, Westech's engine dyno runs start at a 140-degrees F coolant temp and end no higher than 160 degrees. Those conditions are great for generating accurate and repeatable numbers (Westech routinely recalibrates its dyno), but—let's face it—engine dynos aren't truly representative of real-world street conditions. We were about to find out how well these great engine dyno-generated numbers stack up against in-vehicle numbers generated at the wheels on a chassis-dyno.

Over the years, when it comes to chassis dynos, we've heard opinions ranging from a "flat 60hp loss to the rear wheels" to, more accurately: "Expect up to a 25-percent drivetrain loss to the wheels compared to flywheel numbers." According to Brulé, the 25-percent rule applies to typical old-school automatic transmissions and loose torque converters; stick-shifts may lose slightly less because there's no converter slippage—according to some sources, about 15-17 percent.

■ Hicks' PerTronix breakerless distributor has an adjustable rev limiter built in. There's an LED light (arrow) on the module—the number of times it blinks equates to the rpm limit, in thousands. For instance, to set the limit to 7,000 rpm, turn the adjusting screw clockwise until the light blinks seven times.



"I've seen a 700 flywheel hp engine lose 200 hp—nearly 30 percent—at the wheels because they have a 4,500-rpm stall-speed converter and 16-inch-wide rear tires," remarks Brulé. "Wheel weight, tire size and weight, and how fast you are accelerating that tire/wheel mass can drastically change a chassis dyno's recorded results. Then there's airflow through the engine compartment, oil and coolant temperatures, inlet air temps, air cleaner size, the effect of engine-driven accessories, airflow quality through the engine compartment with the hood shut, how tight the dyno's tiedown restraints are, and on and on we go." Keep this in mind as we evaluate the chassis-dyno tests.

■ Clearing the big RobbMc fuel pump requires replacing the Cleveland's FL-1A oil filter with a slimmer Motorcraft FL-400S, which is OE on 4.6L V8 mod engines installed in many early 2000s F-150s, as well as many Ford and Chrysler econoboxes dating back to the 1980s. It has the same stud mounting threads and sealing surface as the classic filter but holds ½-quart less, so an oil and filter change on the 393 with its Milodon pan is only 6.5 quarts instead of the normal 7. We ran Westech's standard dyno electric fuel pump on the engine dyno, but the RobbMc unit on the chassis dyno.



Initial Chassis-Dyno Tuning

Sanchez installed the 393 in the Mustang and drove the car back to Westech. In the car the engine initially had difficulty making a full chassis dyno run; it was lazy over 5,400 rpm and down nearly 160 hp and 77 lb-ft compared to the engine dyno results. Working together, dyno operator Ismael Candia and Sanchez determined Hicks' electronic ignition wasn't receiving a full 12 volts—needed for its proper function. Adding a relay cured the problem.

On an engine dyno, the ignition advance is locked out and only total timing is important. On a chassis dyno, the total ignition curve becomes important. By tweaking the distributor's advance curve, Candia found the engine made as much power with just 7 degrees of base timing and 30 degrees of total timing (base plus centrifugal advance, as read at the crank) as it did with higher total advance. Candia speculates it may be temperature-related, as the ambient air around the chassis dyno is significantly hotter than the controlled engine dyno cell. As a rule, small-block Fords seem to need less timing than GM's classic small-block. In any event, less timing is better than more timing if it doesn't cost any power: The greater the advance, the more the engine is working against itself because the piston is still rising toward top dead center, and 30 degrees offers detonation insurance if Hicks ever gets a bad load of gas.

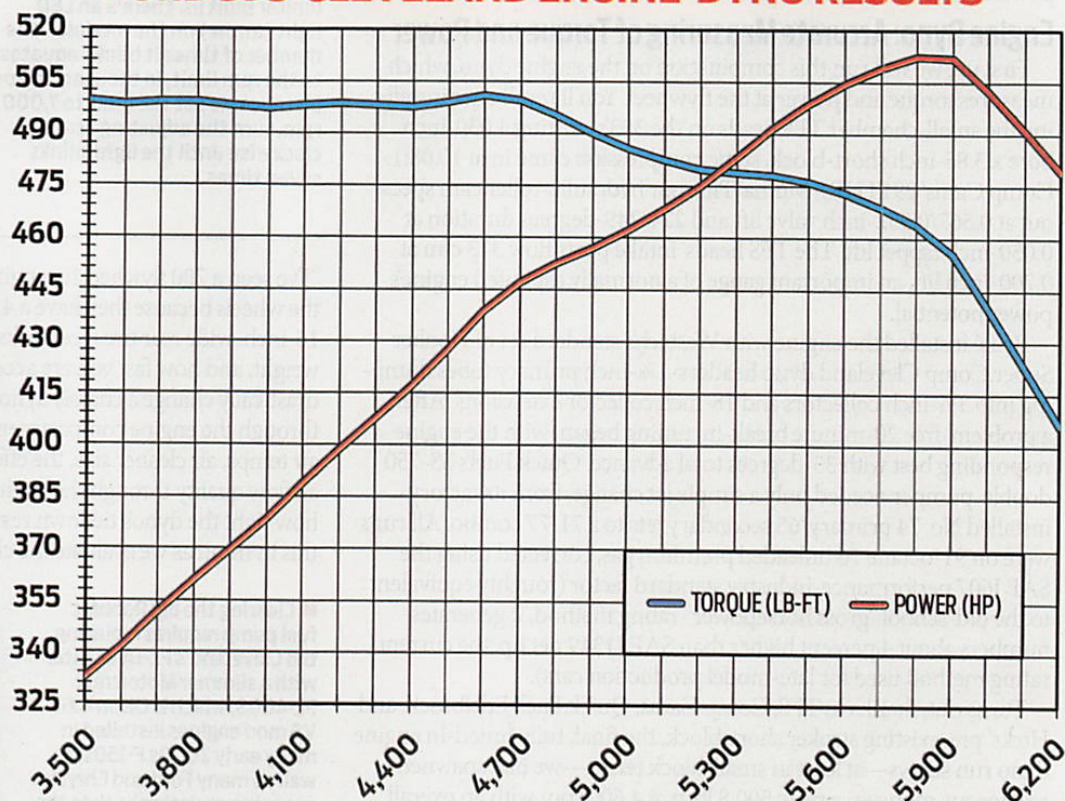
As installed, the carb ran a little rich on the top-end, so Candia leaned out the secondaries by six jet numbers, from No. 77s to No. 71s. But other than carefully adjusting the carb's four-corner idle-mixture screws, there were no other fuel metering changes needed.

FORD 393-CLEVELAND ENGINE-DYNO RESULTS

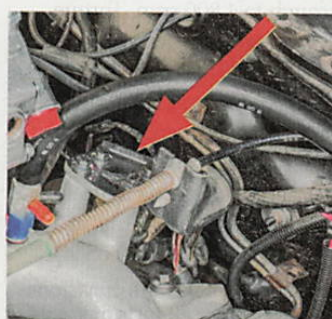
■ Corrected to SAE J607 and running on 91-octane pump gas, the 393 developed 500.8 lb-ft of torque at 4,600 rpm and 512.3 hp at 5,800 rpm on the engine dyno at the flywheel. Note the flat-as-a-pool table torque curve. The only drag was the engine-driven mechanical water pump.



"It's a beast! My wife won't drive it. It's too radical, you might say." But wild horses couldn't drag him away from this now-mean Mustang.
Owner Don Hicks



■ Most chassis dynos extrapolate an engine's power and torque based on vehicle inertia. Many variables can affect those results. It's a great tuning aid, but Westech's Brulé maintains "you can't directly equate the reported torque and power numbers back to engine dyno results, or even the results obtained from two different chassis dynos." Operator experience is critical for obtaining consistent results from small incremental changes.



■ Not obtaining full throttle has tripped up the best of us. AEW's Sanchez modified Hicks' aluminum-plate bracket from the previous low-rise intake/econo-carb installation. "I had to redrill the holes and change the angle, so the cable points and pulls 100-percent straight." It bolts to the existing boss on Edelbrock's Air-Gap intake.

Rear-Wheel Power Losses Analyzed

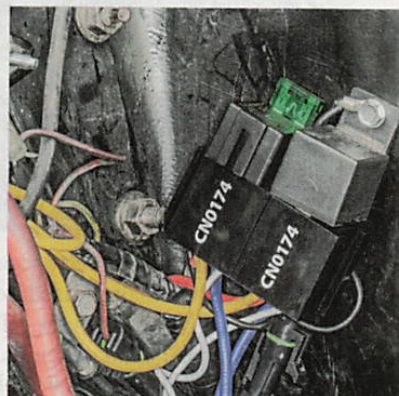
After sorting out the basic tune, Candia made runs without an air cleaner but with all engine-driven accessories functioning. At the wheels, the car made a best of 379.8 hp at 5,362 rpm. Torque peak occurred at 3,657 rpm, with 427.5 lb-ft at the wheels—a drop of about 73 lb-ft and 132 hp compared to the engine dyno. In other words, about a 15 percent torque loss and 24 percent horsepower decline. Hicks was running a T5 manual trans, so that seems a little higher than expected. What was burgling the top-end power?

Analyzing the data later, we honed in on Hicks' mechanical steel flex-fan as one power thief. Back in the day we ran extensive engine-fan tests that established a stock, no-clutch, mechanical fan robs as much as 50 hp on the top-end. Even the best steel-bladed flex-fan costs upwards of 20 hp. The higher the rpm, the more a mechanical fan drags the engine down and the greater the loss. Without the fan we're looking at a 112.5 hp drop (22 percent loss).

The Mustang's massive 9-inch Ford rearend might be another power thief. While a fully-built 9-inch Ford is probably the strongest rearend out there, due to its greater hypoid distance (the distance from the center of the ring gear to the center of the pinion gear), it's less efficient than a 12-bolt Chevy or Dana 60. Years ago, *Car Craft* logged the power to the tires on a Chevy 12-bolt versus a Ford 9-inch. The Ford lost about 2.6 percent on average from a performance engine that made a peak of 326 rwhp at 5,800 rpm.

On the other hand, the late-model T5 has smaller internal gears

■ Hicks' breakerless distributor needs a full 12 volts to run—which it wasn't getting due to voltage drop in the coil's ballast resistor wire left over from the OE points ignition. Installing a 30-amp relay from Westech's spare parts bin was a quick and easy solution. When triggered by the old resistor wire, it sends full voltage to the coil. A second relay sends 12 volts to the carb's electric choke. Included on the parts list at the end of this story are functionally identical Hella universal ISO weather-resistant relays.

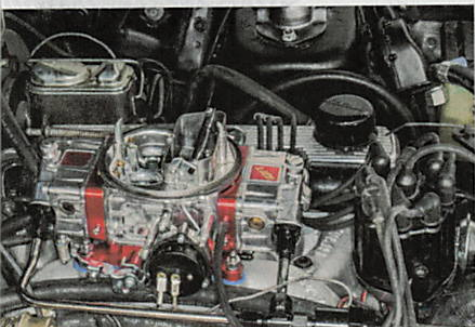


lubed by slippery auto trans fluid, so it's theoretically more efficient than a legacy four-speed. Head-scratchin' time, again.

Then there's a chassis dyno's typical 30- to 40-degree higher engine coolant and oil temps to consider, parameters that the standard dyno correction factors—based on atmospheric pressure, humidity and air temperature—don't really account for.

In place of Westech's 1½-inch engine-dyno headers, Hicks runs Ford Powertrain Applications (FPA) 1¾-inch primary-tube headers that exit via a 3-inch dual-exhaust system with a crossover pipe and DynoMax mufflers—though FPA owner Stan Johnson maintains, "In a Cleveland engine, running under 7,000 rpm, that ½-inch primary tube size difference makes little or no difference; 2 to 3 hp at most."

On the other hand, theory holds that—except for torque converter flash on an automatic trans-equipped car—the peak torque and power rpm points should be the same on a chassis dyno as they are on an engine dyno. But in these tests on the chassis dyno, the torque and power peak rpm points spread out wider (had a greater rpm separation) compared to the engine dyno numbers, and they also occurred at a lower rpm. This could be because of smaller header tubes plus a full exhaust system, or because a chassis dyno extrapolates engine



■ Quick-Fuel's SS-750 double-pumper carb is one of the few premium carbs that retain an electric choke combined with high-end features like replaceable air bleeds and screw-in PVCR restrictions. Note the vacuum advance connected to spark-ported vacuum and fabricated G&J stainless steel dual-feed fuel line.

rpm from wheel speed and sometimes lags engine speed (somewhat analogous to a slow tach) . . . or both!

Two hp here, five hp there: These numbers and variables start adding up and suddenly you're down 100hp, or more. And we haven't yet considered the air cleaner.

But Will the Air Cleaner Clear a Mustang Hood?

Ah, the air cleaner. Real street cars need to run one, but not all are created equal. The rule of thumb is that there's no such thing as too big an air cleaner. Mustangs from 1971-1973 are notorious for hood-clearance issues with the standard flat hood, and Hicks now had a brand-new Edelbrock Air-Gap 351C dual-plane high-rise intake.

K&N sent us a bunch of its Xstream Air Flow-series air cleaners. These are 14-inch-od, open-element air filters with varying-height filter elements and different amounts of base drop—plus the lid does double-duty as an additional filter element. Too much base-drop can restrict flow into the carburetor because the air must turn too sharply into the venturis. Excessive drop can also interfere with the choke and choke linkage. Ideally, you want zero drop or even a raised base, but we knew going in that wasn't in the clearance cards.

On the chassis dyno, a 3-inch standard-height filter element on a $\frac{7}{8}$ -inch dropped base had no overall restriction compared to running no air filter. At the peaks, this combination made 7 lb-ft more torque but 1.3 hp less than running with no filter. In terms of overall average numbers from 3,000-5,750 rpm, it was higher by 2.9 lb-ft and 1.3 hp. That's an insignificant difference on a chassis dyno. Unfortunately, it wouldn't let the hood close.

Next, we tried a 1 $\frac{1}{4}$ -inch dropped base, still with a 3-inch element. It gave us another $\frac{3}{4}$ -inch clearance, just enough to allow the hood to fully close while not interfering with the choke, but the dyno pull was down and more ragged. It cost 4.7 lb-ft at the peaks, and nearly 14 hp on top, with the engine peaking early at 4,989 rpm. We suspect the lower lid height is interfering with airflow through the carburetor's airhorn, and possibly the air vents, causing an airflow restriction and some instability in the metering curve.

We also tried running a shorter 2-inch-tall element on the $\frac{7}{8}$ -inch dropped base, but the falloff was even worse. Without getting a Boss 351 NACA-duct hood or a custom bulged hood, this was as good as it was gonna get in-car: 365 hp and 430 lb-ft.

Is an Engine Dyno or Chassis Dyno Better?

If you want accurate numbers in a carefully controlled environment, the engine dyno is the way to go. Engine dynos directly measures true torque at the flywheel, so it will tell you how much

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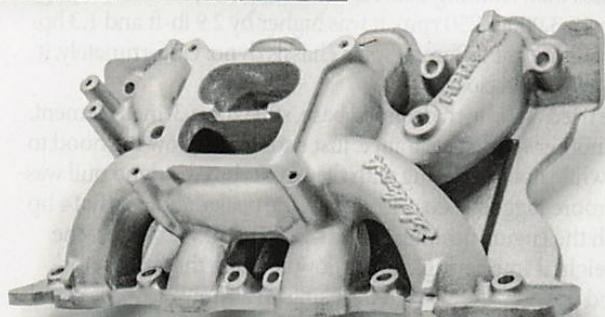




■ Don Hicks' stock Ford flex fan: Even the best flex fans cost up to 20 hp, with many stealing much more than that. For the ultimate fan horsepower-loss test, see my article "Save Power and Keep Cool with an Electric Fan" (*Car Craft* May '00). If running a mechanical fan, a standard (not heavy-duty or towing) thermostatically controlled clutch-fan has the least horsepower drop.



■ K&N's Xstream series air cleaners have a unique flow-top filter-element lid for more filter area, which it says increases power and accepts more dirt without a performance loss. The Mustang needed 1¼-inch drop; K&N PN 66-3040 has that drop, a 3-inch-tall x 14-inch-od element, and a 2¾-inch overall height measured from the carb-neck flange. Summit Racing, the price source for most parts used in this project, sells it for \$131.99 (as of April 2020).



■ Hicks' new Edelbrock RPM Air-Gap 351C is about 1.12 inches taller than his previous Edelbrock Performer 351C-2V. Is there a low-restriction air cleaner that clears a 1971-1973 Mustang's flat hood?

power the engine makes in a perfect world. A properly controlled engine dyno cell, a carefully calibrated engine dyno, and a good operator is capable of test repeatability within 1 percent.

If you want to know how the engine will run as installed in your vehicle, and/or determine overall drivetrain performance and efficiency, then the chassis dyno is the better choice. However, it doesn't directly measure torque; instead it extrapolates output according to the chassis dyno manufacturer's software logic. Also understand it's harder

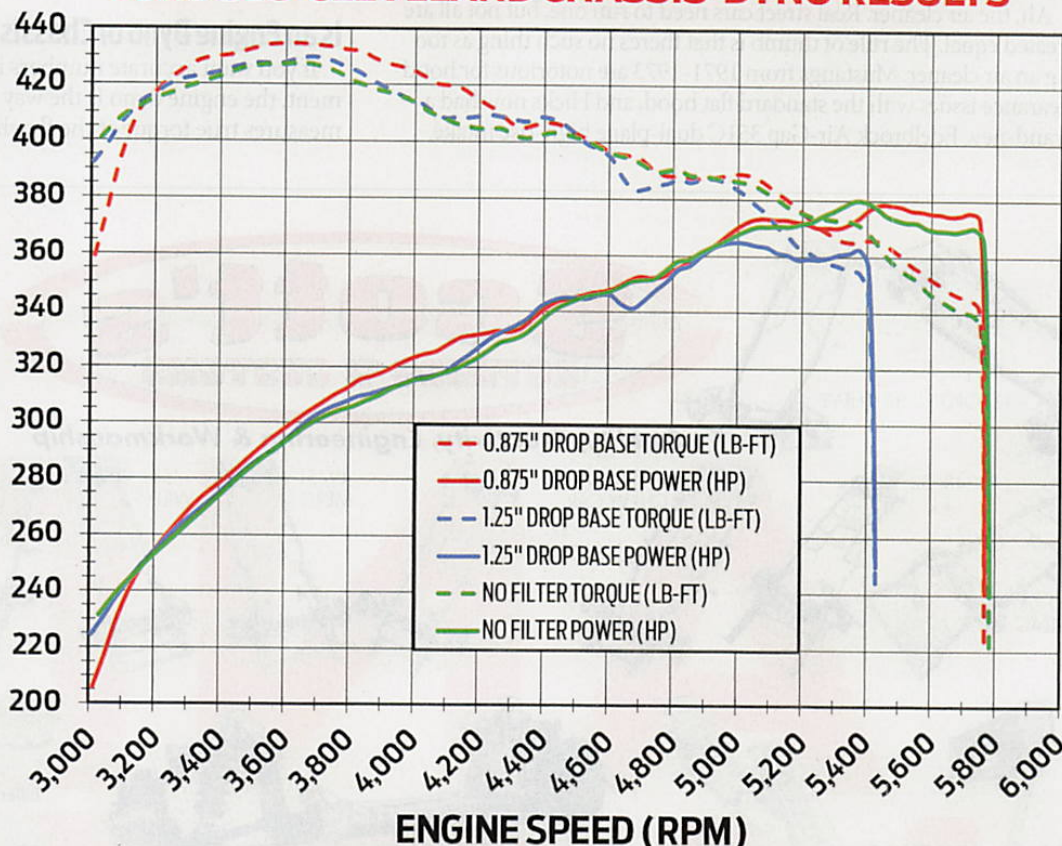
■ The best chassis dyno horsepower numbers were down about 22 percent versus the engine dyno. Interestingly, torque and power using a K&N air cleaner with 7/8-inch dropped base were slightly better over the full curve than with no air cleaner. We had to install a 1¼-inch-drop base for hood clearance—which cost us another 14 hp on the top-end.

to get back-to-back repeatability, even on the same chassis dyno, so expect at least a 5-percent variance in otherwise-identical back-to-back runs. There's greater variance in results from different chassis dynos then there will be on two different, but properly calibrated and corrected, engine dynos.

THE FIX IS IN

We've been saying this for a while now: The cost of modern aluminum heads is now cost-competitive with trying to recondition old, worn-out iron heads. In the Ford Cleveland line particularly, most stock heads have nonadjustable valvetrains, and for that engine family, an adjustable valvetrain conversion

FORD 393-CLEVELAND CHASSIS-DYNO RESULTS



FORD 393 CLEVELAND ENGINE DYNO VS. CHASSIS DYNO

TEST DESCRIPTION	FULL PULL RANGE (RPM)	MAX OUTPUT @ RPM		MAX LOSS FROM ENGINE DYNO				PEAK-TO-PEAK SPREAD (RPM)		PEAK-TO-PEAK AVERAGE OUTPUT		PEAK-TO-PEAK AVERAGE CHANGE FROM ENGINE DYNO			
		TORQUE (LB-FT)	POWER (HP)	TORQUE (LB-FT)		POWER (HP)		RANGE	AMT.	TORQUE (LB-FT)	POWER (HP)	TORQUE (LB-FT)		POWER (HP)	
				AMT.	PERCENT	AMT.	PERCENT					AMT.	PERCENT	AMT.	PERCENT
Engine dyno	3,500-6,200	500.8 @ 4,600	512.3 @ 5,800	—	—	—	—	4,600-5,800	1,200	482.5	476.9	—	—	—	—
Chassis dyno, no air filter	4,491-5,760	427.5 @ 3,657	379.8 @ 5,362	-73.3	-14.6%	-132.5	-24.2%	3,657-5,362	1,705	397.9	342.0	-84.5	-17.5%	-134.9	-28.3%
Chassis dyno, K&N filter, 7/8"-drop base	4,479-5,762	434.5 @ 3,634	378.5 @ 5,441	-66.3	-13.2%	-133.8	-26.1%	3,634-5,441	1,807	400.0	346.0	-82.5	-17.1%	-131.0	-27.5%
Chassis dyno, K&N filter, 1¼"-drop base	4,463-5,430	429.8 @ 3,667	365.0 @ 4,989	-71.0	-14.2%	-147.3	-28.8%	3,667-4,989	1,322	404.4	333.4	-78.1	-16.2%	-143.5	-30.1%



\$129⁹⁹

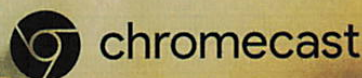


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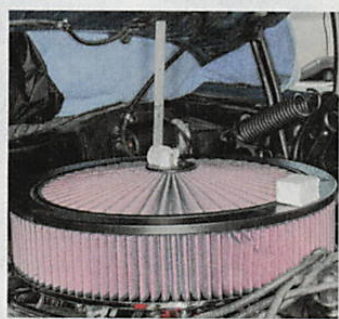
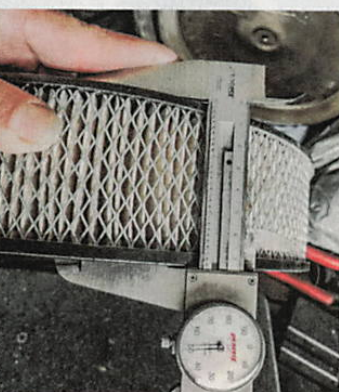
is complex because the valve and rocker-stud centerlines are canted in all three axes versus the cylinder-head deck. In this case, the botched conversion may also have caused the original cam failure, but, as Sanchez puts it, "The world may never know for sure."

The new Comp Mutha' Thumpr hydraulic-roller cam

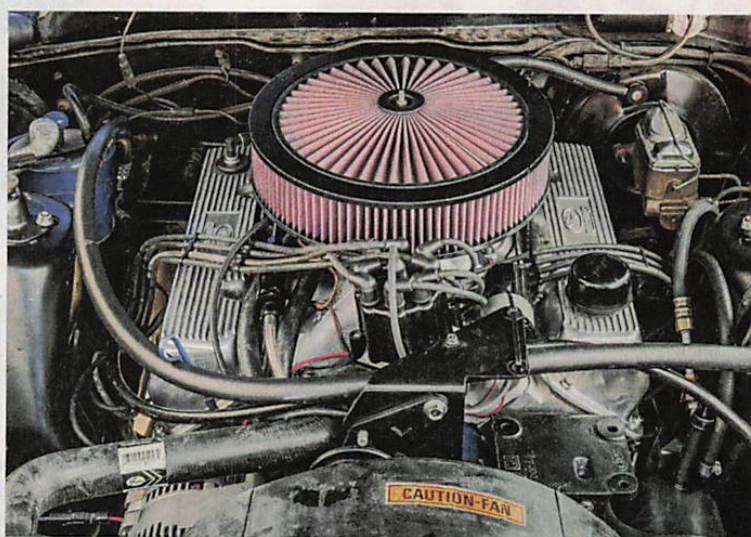


■ Bench measurement is one way to determine air cleaner-to-hood clearance. Measure the old filter assembly dimensions, including the filter thickness, the lid thickness, the base drop, and any hold-down protrusion above the lid. Don't forget to account for the metal thickness.

■ Verify your math using the clay method, especially (as in Hicks' case) when dealing with a new intake and carb. Place clay lumps on the air cleaner lid's highest point. Slowly close the hood—stop if you encounter resistance. Otherwise, continue to full-latch closure. Open the hood and measure the compressed clay's height—this is the amount of clearance. AEW's Sanchez likes at least 1/2 inch to account for engine rock.



really shined on the dyno and is performing great as a daily-driver in Hicks' Mustang. We also like the Quick Fuel SS-750 double-pumper carb. Out of the box, it only needed basic curb-idle and fuel mixture adjustment, plus some slight rejetting. But it's nice to know all those high-end granular tuning features are there if ever needed. ■



■ Hicks wanted to retain a relatively stock look. Besides the cool-looking K&N air filter, you'd never know there was a 500-plus hp engine in there—until he starts it up.

■ AEW and Westech recommend Lucas high-performance and racing motor oils—on the 393, Lucas high-zinc 30W break-in oil, and Lucas conventional 20W-30 Hot Rod and High-Performance Motor High-Zinc oil after break-in.

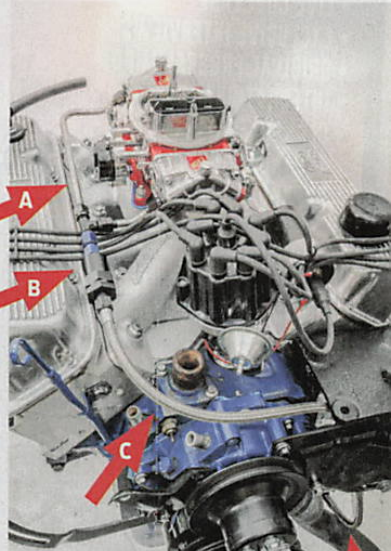


PARTS AND DYNO-TEST PRICES (PART 3)

Does not include any shipping fees, miscellaneous small hardware, or sales taxes. Priced 02/12/20 and subject to change. All dimensions in linear inches, except as noted.

BRAND	PART DESCRIPTION	PART NO.	AMT.	PRICE	
				FROM	COST
A. PARTS					
ARP	BOLT KIT, engine clutch cover to flywheel, High-Perf series 180,000 psi, fits Ford 1986-1995 302-351W T5	150-2202	1	Summit	\$15.99
	BOLT KIT, engine flywheel, Pro Series 190,000-psi, 7/16-20 x 1, flat 12-pt wrenching head, full-od shank (6/pkg)	200-2802	1	Summit	\$17.99
	BOLT KIT, exhaust header, 4130 steel, black oxide, 1/2-16 x 0.750, 1/2 hex head, fits big-block Chevy & Ford (16/pkg)	100-1102	1	Summit	\$18.99
G&J AIR-CRAFT	SUPPLY SYSTEM, engine fuel, pump-to-carburetor (includes braided stainless steel Teflon-core hose, dual-feed Holley stainless steel manifold, inline filter, misc. fittings & fabrication)	—	—	G&J	\$122.99
HELLA	CONNECTOR & PIGTAIL ASSY., mini-ISO weatherproof, fits Hella skirted relay ¹	H84709001	2	Summit	\$23.92
	RELAY ¹ , electrical, mini-ISO, skirted, weatherproof, 12V, 40-amp NO/20-amp NC, resistor-coil suppression, mounting bracket	007794301	2	Summit	\$12.76
K&N	CLEANER ASSY., carburetor air, Xstream Airflow, 14 od x 3 H, 1.25 drop base, 2.75 net height from carb flange	66-3040	1	Summit	\$131.99
HOLLEY	JET, carburetor main, 1/4-32 UNEF, No. 71, 0.0750 orifice, per pair (1 pair primaries on engine dyno; 2 pairs on chassis dyno)	122-71	2	Summit	\$17.14
	JET, carburetor main, 1/4-32 UNEF, No. 77, 0.0855 orifice, per pair (1 pair secondaries on engine dyno)	122-77	1	Summit	\$8.57
LUCAS OIL	OIL, engine, conventional, break-in, SAE 30, (1) 1 qt bottle ²	10630-1	1	Summit	\$8.99
	OIL, engine, conventional, break-in, SAE 30, (6) 1 qt bottles/case ²	10630	1	Summit	\$34.99
	OIL, engine, conventional, Hot Rod & Classic Car High-Performance, SAE 10W-30, (1) 1qt bottle ²	10687-1	1	Summit	\$7.99
	OIL, engine, conventional, Hot Rod & Classic Car High-Performance, SAE 10W-30, (6) 1 qt bottles/case ²	10687	1	Summit	\$37.99
MOTOR-CRAFT	FILTER, oil, 4.720H x 2.980W, 11-14-psi relief valve, 20 micron, 200-psi burst, 3/4-14 thread (OE 2006-2008 F-150 FX2 4.6L V8) ³	FL-400S	2	Summit	\$13.98

NOTES: ¹Used to supply full 12 volts to ignition in run and to carburetor choke. ²6.5 quarts needed per complete fill. Run engine in with break-in oil, drain oil, and refill with listed conventional oil. ³Two filters used—one for break-in, one after break-in.



■ G&J Aircraft fabbed the 3/8-inch fuel plumbing from mechanical fuel pump to carb. Parts include dual-feed fuel stainless steel fuel log (A), inline fuel filter (B), Teflon-cored stainless steel braided hose (C), and miscellaneous 37-degree fittings. Don't use rubber-core braided hose with today's oxygenated fuels—they'll rot from the inside out (see "When Good Hoses Go Bad" on HOTROD.com). Debris can break off and clog the needle-and-seat or the fuel-injection nozzles.



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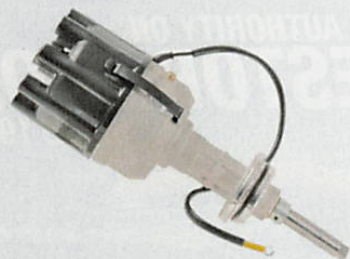
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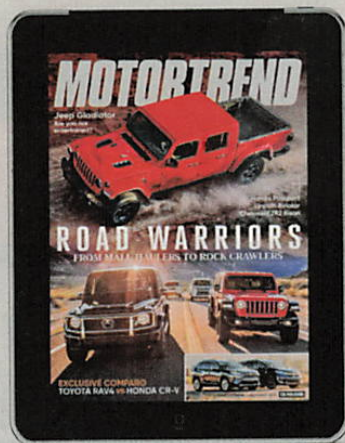
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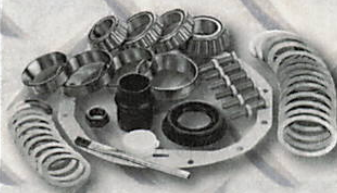
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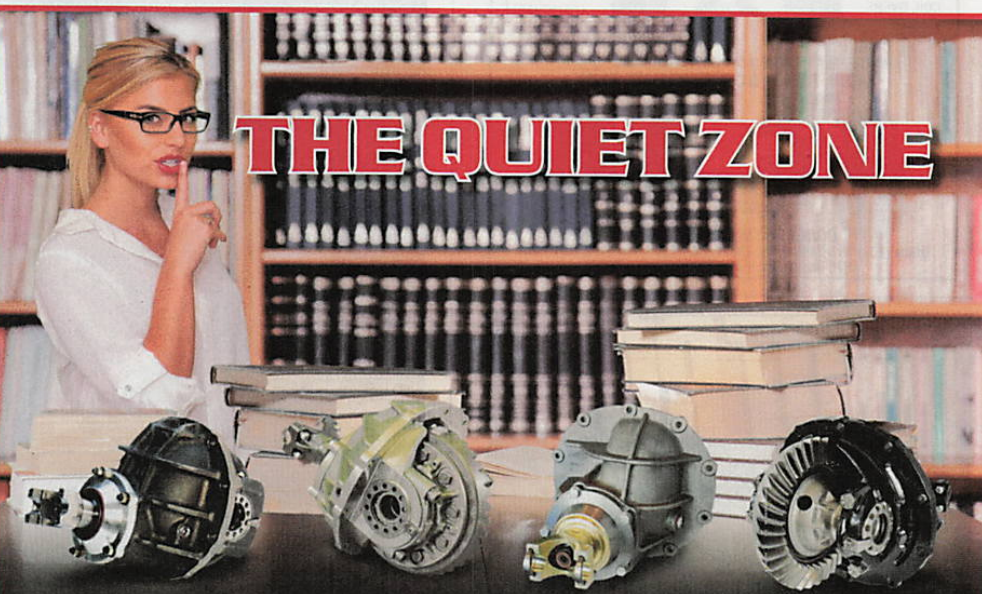
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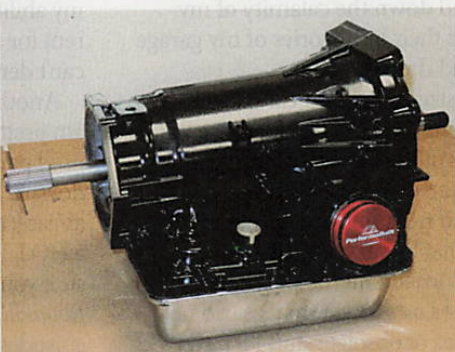
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I'm writing this on April 15, 2020—perhaps significantly, as it's the anniversary of the Titanic sinking and that seems allegorical of humanity these days. I can't predict how the Coronavirus program will be by the time you read this, but I can tell you that I, like you, am sick of hearing about it. So let's look at the positive: gearhead productivity worldwide has spiked over the last four weeks of quarantine. Faced with nothing left to do because none of my cars are currently on the property, I stared down the calamity of my garage. Moms don't tell their kids stories of my garage because they'll have bad dreams.

I have a slightly oversized 1941 two-car garage and no fantasy of ever parking a car inside it because it's overflowing with boxes of the detritus of my gearhead life and car-journo career. Of course there are a whole bunch of great parts and treasures of automobilia, but you'd never know that by surveying the pile of boxes that looks like a tornado hit the warehouse at the end of *Raiders of the Lost Ark*. I rarely get rid of anything, so I have boxes of obsolete stuff I'll never use that was involved with, say, a *Car Craft* magazine story on Buick engines that I wrote 25 years ago. And in the past 9 years that I've been hosting the *Roadkill* TV show, I've been home perhaps five days a month, leaving no time to be sensible about the storage of my many leftovers. There have been times that the front of the garage was so packed that the doors would not close on one more item, so I've simply heaved boxes of speed parts as far as I could to the back of the place. OCD folks are probably melting down about now.

It doesn't help that I at one time had a bad eBay habit. Several years ago I made a sign that says "If it doesn't: 1) Fit a car I currently own, 2) Help with El Mirage/Bonneville, 3) Help with family adventure trips...GET RID OF IT!" How do you think that's worked out?

Quarantine pushed me to solve the problem that's been on my mind for a decade. I moved nearly everything out of the garage, working on one side at a time. That 170-pound box of scrambled fasteners? I organized it into piles: bolts, nuts, adel clamps, and so on. Did the same with probably \$10K in leftover AN hose ends and fittings. I opened every box, and each item was triaged as keep, trash, or sell. The keep stuff was packed more neatly and then stacked with like items. Trash was trash, and the "sell" pile is now destroying my ability to park in one of the storage garages that I rent for actual vehicles. This is bad economics. And I can't deny the fear about the future of swap meets.

Another tactic was to turn boxes into engines. I am pretty sure I have what it takes to conglomerate used parts into a complete 350 Chevy (because who doesn't?), especially because I unburied one that was already a short-block—a dismantled leftover from a HOT ROD cylinder-head test in 2005. I'm pretty sure you'll see that process in an upcoming episode of *Roadkill*, as we've planned to include it one of our episodes that will be shot during our stay-at-home plan. I'm developing a much greater appreciation for the work of our director and camera/audio crew.

So by now I have the garage where I can walk from front to back, with few sandaled-toe-threatening obstacles, on both sides. It's still stacked to the rafters, and I keep hoarding items that don't fit current cars and so forth, but at least it's making me happy today. I'm writing this from a desk that has almost three square feet of free space, and I've even been using my work table to assemble some valvesprings onto heads.

Meanwhile, prices have been dropping on eBay. I've nabbed enough dirt-cheap stuff to build a retro 331ci small-block, and took a break from writing this so I could score some vintage blue anodized Moroso valve covers. I'm confident you can see how that's gonna end. If only this quarantine ends.



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